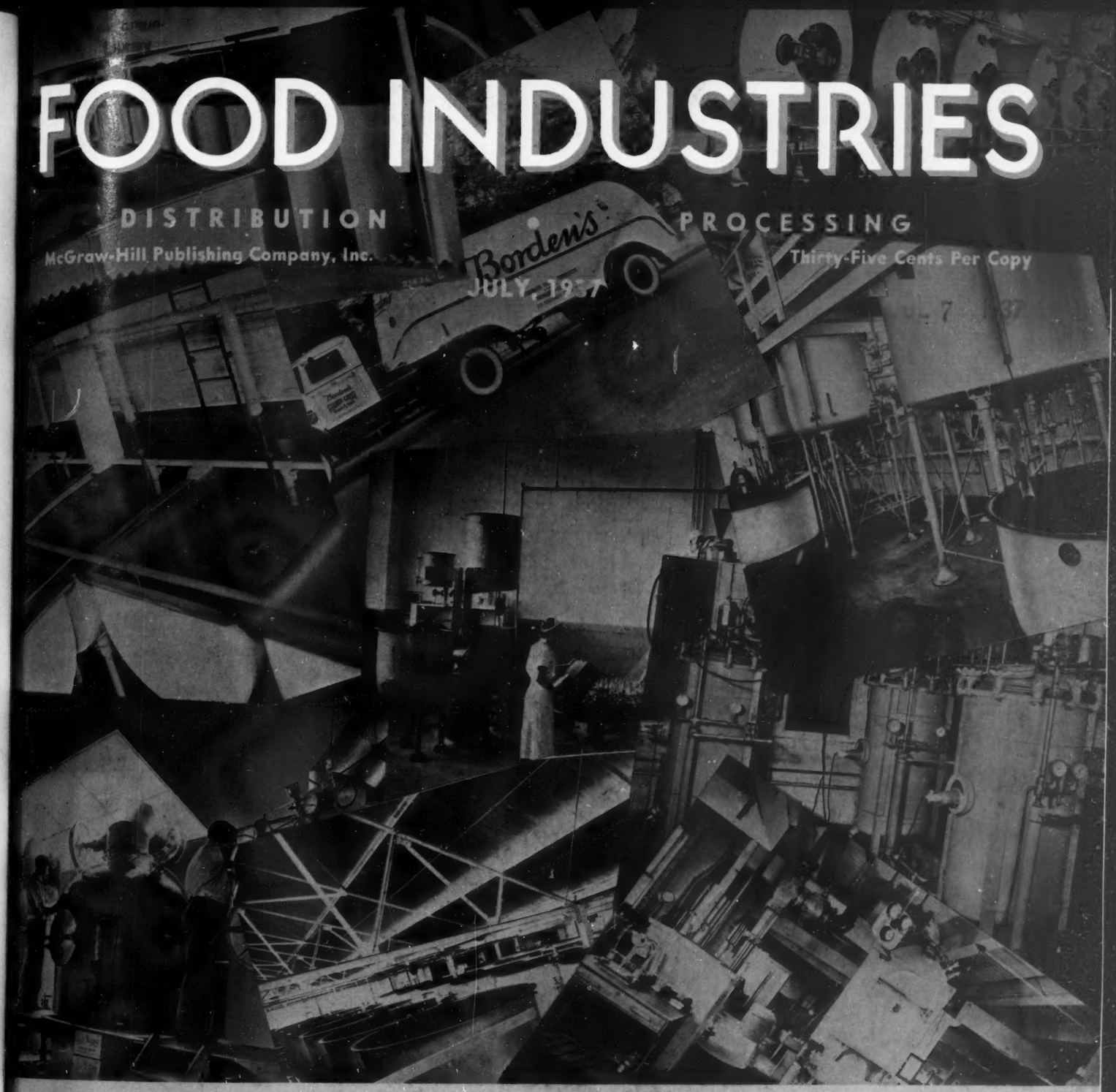



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Pfaudler MEETS THE ACID TEST

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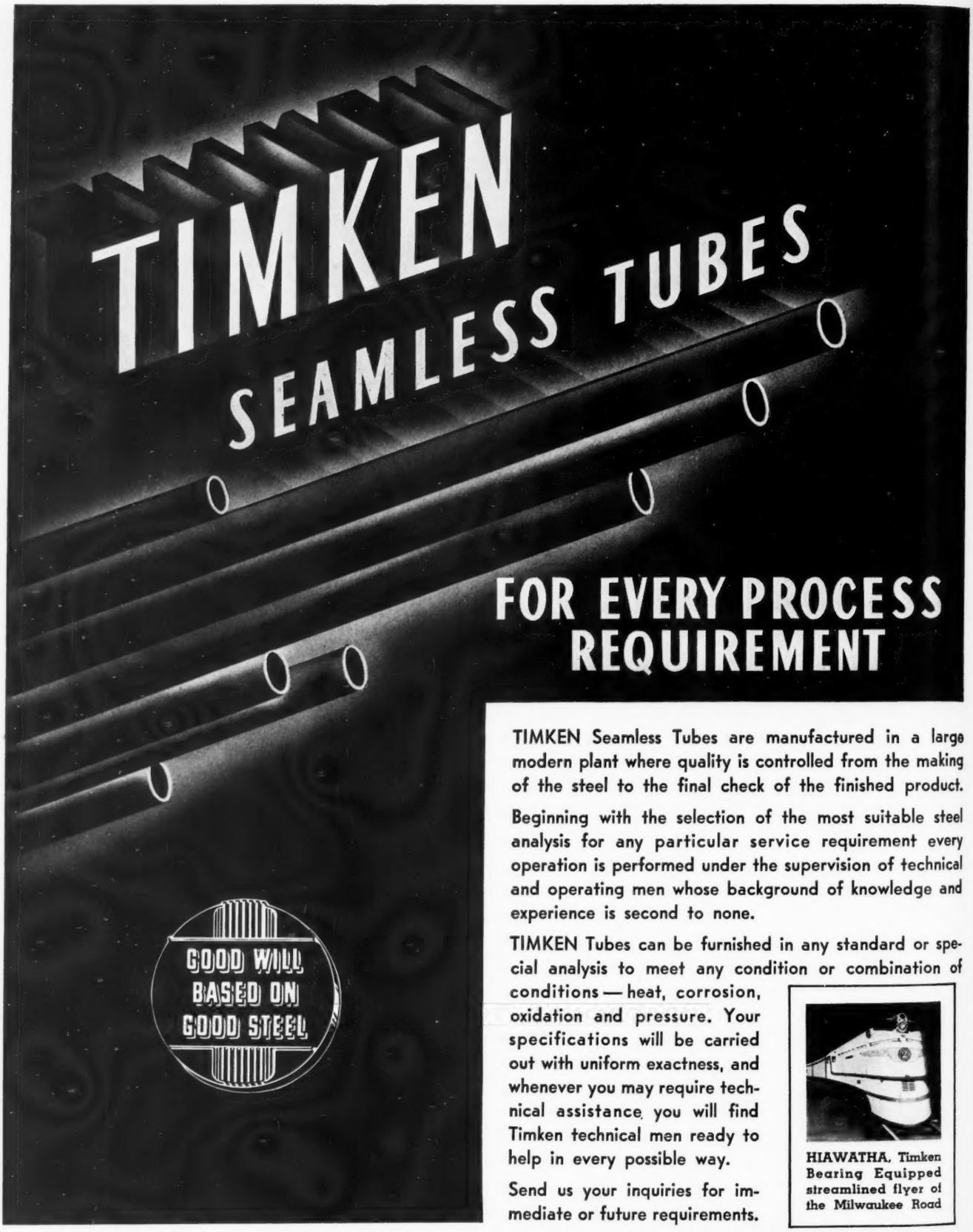


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# TIMKEN
## SEAMLESS STEEL TUBES

# FOOD INDUSTRIES

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# FOOD INDUSTRIES

DISTRIBUTION • PROCESSING

Established 1928—McGraw-Hill Publishing Company, Inc.

Vol. 9, No. 7

*Laurence V. Burton, Editor*

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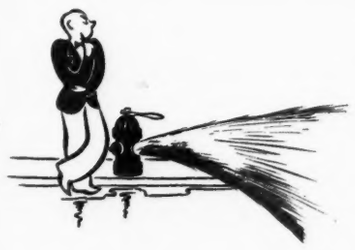
JULY 1937


# The Talk of the Industry

» SOMEBODY down in Mexico writes that the magazine *Time* refers him to FOOD INDUSTRIES for complete information on Hydroponics. Unfortunately we have no specialist in Hydroponics, nor does our new and unabridged Webster's Dictionary even mention the term. Of course, one could pick up the telephone and dial VAnderbilt 3-2400 and ask *Time* "Whatsabig idea?" But that would be cheating. Our diabolical notion of Timeworthiness is to let the Mexican Timesubscriber knowledge seeker ask *Time* what Hydroponics is or are.

That ought to end the matter. But it doesn't. Some one else has sent us mimeographed Bulletin No. 7 from the American Hydroponic Society, 1553 North Clark St., Chicago. That publication lists 53 elements that it avers are essential to life and includes Helium, Neon, Argon, elements which, if memory serves, do not com-



bine with any other elements. And still we do not know exactly what Hydroponics are or is, though we believe there is some mistake about it.

» SMART CHAP, that economic royalist who incorporated his steam yacht, endowed the corporation with enough income bearing securities to pay the cost of operating the yacht, and then rented it to himself for $100 a year. He could pay the cost of running the yacht out of the taxes he saved. The operating loss of the corporation offset the income from the securities. Only two things prevent most of us from doing the same thing: lack of a steam yacht and the necessary millions.

Some day another smart egg will figure out a parallel method of saving corporate surpluses from the alternative of forced dividend distribution or taxation.

»MORE THAN 5,790,000 gal. of cod liver oil, valued at $3,547,000 were imported into the United States in 1936, according to the Chemical Division of the U.S. Department of Commerce. This is the greatest volume ever recorded in one year, being almost 1,000,000 gal. above the 1935 figure.

However, the department did not reveal the exports of halibut liver oil or other fish liver oils which, though much smaller in volume, are tremendously higher in vitamin potency and in unit price.

»ONCE AGAIN we shed a crocodile tear over the sad plight of the United States marshall. He must have some unenviable tasks, such as the job of "destroying" eighteen barlers of crab meat as related in Food Decision No. 25,664. This lot of crab meat was shipped from New Orleans on Aug. 19 to Washington, D. C., where it was labelled as containing filth. On Jan. 23 of the following year, "no claimant having appeared, a default decree of condemnation, forfeiture and destruction was entered."

One is almost tempted to agree that there might have been a few evidences of slight spoilage by January.

» HEALTH NOTE: In Detroit the forces of law refused or failed to evict sit-downers; in Chicago the loyal workers were theoretically ousted

from the plant on the ground it is a violation of the health ordinances for them to eat and sleep in the mill. But it is O.K. to sleep in a Pullman car in a mill. Wonder if they sleep in three shifts, thus obtaining maximum use of the cars?

»DIETETIC NOTE: Food faddists will find small comfort in the following jingle from no less authority than Dr. E. P. Cathcart of Glasgow.

"Eat all kind nature doth bestow;
It will amalgamate below.
If the mind says so, it shall be so.
But, if you once begin to doubt,
The gastric juice will find it out."

» ALSO, FADDISTS will derive scant satisfaction from a fairly recent announcement of a list of foods which

disagreed with 1,000 healthy persons. The foods that were the most frequent offenders, arranged in their order of frequency, included: raw onions, radishes, cooked cabbages, beans, greasy foods, cucumbers, cooked onions, raw tomatoes, raw peppers, frankfurters, and sauerkraut. (J. Am. Diet. Assn. 12, 314, 1936.)

### *Food vs. Chemicals?*

SOME DAY WE HOPE TO BE ENLIGHTENED on the true difference between a chemical and a food. A recent publication of the U.S. Department of Commerce carries this statement: "Actually, few chemicals as such are incorporated in food products." It sounds as if the Department knows the difference, but it doesn't.

Take the following list of substances. Are they foods or chemicals? Acetic acid, citric acid, tartaric acid, lactose, sucrose, levulose, dextrose, maltose, glycerine, stearic acid, sodium chloride, sodium bicarbonate, asparagine, tryptophane, and so on.

It would be gratifying to see an end to artificial distinctions between foods and chemicals. All foods are chemicals, most of which are of exceedingly complex nature—but chemicals nevertheless. If the lay public is to be properly appreciative and not fearful of advances in food technology, those who are well informed should watch their language.

### *Ominous Signs*

HIGH PRICES FOR COTTON during 1936 have had the result to be expected where men are still human beings and not supermen. Southern cotton growers have reacted to the unusual prosperity and a 14 to 15,000,000-bale crop is said to be in the making. If such a huge crop materializes it is anticipated by cotton experts that the price will go down to the bare cost of production. Reason: the U. S. uses ordinarily only half that much cotton. Exports must take the rest. Apparently only war or bad weather can stop a marked price decline. And, of course, this will inevitably mean reduced buying power in the South, but plenty of cotton seed for the oil pressers.

### *"Said To Myself, Said I . . ."*

BRYCE B. SMITH, manager of General Baking Co's. Kansas City plant faced a strike in May. Now, as is well known to all bakers, the Mayor of Kansas City is Bryce B. Smith. So when Manager Smith appealed to Mayor Smith for police protection during the fracas, the Mayor saw his duty and did it with commendable civic zeal.

### *Why Smell Coffee?*

ANYONE who has witnessed the skillful and graceful movements of an experienced coffee taster sitting at a revolving table with a big brass "cuspureen" within easy aim cannot but be interested and entertained by the ritual of inhaling fragrant aromatic vapors followed by tasting the brew.

Laymen who imitate the coffee taster's movements will not know why they are doing it though they may look very wise. Those who may believe that smelling is a method of detecting something of special excellence in coffee should be informed that this test is a negative test for the purpose of detecting foreign flavors and odors, especially moldy beans. If the aroma is normal the real test —the determination of suitability of flavors—begins.

### *Progress in Reverse*

ALL OF THE EIGHTY-FIVE silica-gel refrigerator cars, which have been operated during the past eight or nine years by Safety Refrigeration, Inc., have been taken out of service. Their refrigerating units have been removed and the cars have been sold to operate as ordinary iced "reefers." And with this move, progress in the shipping of perishables has taken a beating.

These cars had operated 17,000,000 car-miles. Their performance had been satisfactory, temperatures had been maintained uniformly with comparatively low operating and maintenance costs. But the lengthy com-

## *Hors d'Oeuvres*

• "Eat, drink and be sober, for tomorrow you may need your wits about you" might be a slogan for confectionery manufacturers. Yale scientists say that if you eat candy before partaking of the fiery water, sugar goes into the blood and lessens the effect of the alcohol.

• *It may not be cricket to call a British sailer a "Limey," but the term originated as the result of a commendable practice. The famous Captain Cook discovered during a sojourn in the West Indies that lime juice prevented scurvy among his men. And in 1867, this juice was made a part of the daily ration on English boats.*

• A milk bar has been installed by Chateau Moderne in the heart of New York's cocktail district. The menu calls for all sorts of drinks with a milk or cream base. Straight milk is available on request, and milk of magnesia will be served if the occasion demands.

• *The average American drinks a cup and a half of coffee daily. Half of the second cup apparently is spilled into the saucer.*

• A recent test indicates that a soft overripe tomato is likely to be lower in vitamin C than a firm ripe one. But, oh, what a swell splatter it makes!

• *The government, not too friendly toward the packing industry in recent years, got its "Uncle Sam" monicker from a meat packer. During the War of 1812, "Uncle Sam" Wilson of Troy, N. Y., supplied beef to the Army in barrels bearing his "U. S." stamp. This meat became known to the Army as "Uncle Sam's," and that appellation thereafter was bestowed on the government. Wonder if John Bull has a similar significance?*

• Dear! Dear! An increase in dog diseases due to diet deficiencies allegedly has accompanied the recent skyrocket growth of the dog food business. Pity the poor pampered pooch!

• *The Japanese sell a single canned oyster for the price of 59 cents. It can't be done? Yes it can, if you guarantee a "pearl" in every oyster, as the Japanese do.*

• FTC has ordered North American Mate Co. to stop telling people that its health tea has food value and is an effective remedy for anemia, malnutrition, rheumatism, stomach and nervous disorders and eye trouble. Such regimentation!

• *Eating fat neither causes goiter nor aggravates existing goiter, according to findings by Dr. Roe E. Remington, South Carolina State Medical College. But it does cause a noticeable swelling in the general region of the waistline.*

• Some foods, particularly fruits, are better raw than cooked. But most nuts are more palatable when cooked. except the *homo sapiens* variety, at its worst when thoroughly stewed.

mercial test of these cars met with the usual obstinate resistance to change so commonly exhibited by railroads.

Most of the railroads already had what they considered to be adequate ice-and-salt refrigerator cars. Many refused to accept delivery of the empty cars on their lines to pick up a pay load. And ice-and-salt cars are cheaper to build anyway.

With the permanent departure of these silica-gel cars from service there is no railroad service available by which temperatures may be accurately controlled at all specified temperatures.

All shippers of perishables, especially of frozen foods, will regret the decision of Safety Refrigeration, Inc., to abandon this unique service. And we believe the railroads will live to regret it also, for already we know of two more refrigerated trucks that have been put into service in late May as a result of this move.

### *Common Sense vs. Lawyers In Wagner Law Problems*

ISN'T IT ABOUT TIME for many manufacturers to overhaul their thinking? Legal advice is ever a valuable commodity but there are times when it appears as if the lawyers are laying down on the job—taking refuge in the technicalities of the law—even counseling that there is nothing that the management can do about the complex problems raised by the Wagner Law.

Apparently, as a result of purely technical counsel by the lawyers, some concerns have adopted a supine attitude toward both racketeering and professional "labor leaders." In effect, the element which makes a nice living out of fomenting disorder is invited to step up and help themselves to a big piece of cake.

Yet management is not wholly without recourse to measures to defend its rights, even though its past history of industrial relations may not always have been as wise as it might have been. Those concerns with the best record are likely to find the easiest going in these vexatious days.

Legal opinion must be merged with common sense and knowledge of the facts to formulate a sound procedure. To illustrate: Cases have recently arisen where old and highly successful employee representation plans have been thrown overboard despite the very evident anxiety of the employees to continue some form of organization patterned after the previous method. The lawyers, however, ruled that it was illegal and advised management to have nothing more to do with the old plan. They ruled that it is illegal to permit employees to meet on company property or to provide them with any facilities however meager to begin the new organization. In extreme cases the attorneys have ruled that management could not counsel with their employees on their own organization problems.

Perhaps, according to a strict technical interpretation of the law, they are correct. Yet there is a way to help them. If even a small group of the employees should unite for collective bargaining purposes, management has a perfect right to confer with them. Most workers are limited in their experience as to the ways and means of getting an organization started. If they knew all about it they would probably be employers themselves. Lacking the requisite knowledge, they are as bewildered as children. Abandoned by management, they seek leadership, and usually there is a professional leader ready to assume the job.

When management is unaware of what it can do under the law there are two sources of aid. One is the Regional NLRB. The other is the U. S. Department of Labor. The NLRB is very limited in its authority. It cannot step into a dispute unless it is invited. However, many of the regional boards are manned by capable people who often can be persuaded to express an off-the-record opinion as to possible or permissible procedure.

THE REAL SOURCE of help should be the U. S. Department of Labor. It's conciliation service is too small a group, but these men are usually able and well informed. Furthermore, they are empowered to take the initiative and can also be called in by either side. They are public employees with salaries paid by public taxation. They are not exclusively the servants of labor. Rather they are specialists in the field of labor relations and should be asked to come in long before a situation becomes acute.

The best advice at the present time is to learn to know the Regional Board and how to utilize the functions of the Department of Labor. Management may not believe it is wise to confer with representatives of potential organized groups, but the conciliator can do so and can act as an intermediary if the management can convince the conciliator of its genuineness and sincerity. Here is where a clean record is a great help.

To abandon the loyal groups to whomever chooses to take them into camp is not always desirable—nor is it necessary.

### *Between Something and Nothing — There is No Choice*

IF MANAGEMENT is gifted with foresight it is taking a long look ahead toward the day when the National Labor Relations Board may be summoned to hold an election in its plant. This election will be held to give employees a chance to vote on who will be their representative for collective bargaining.

When that election shall come it is desirable that the employee shall have two alternatives. Some NLRB elections have been held which were exactly like a so-called "election" in Germany. Doubtless you remember Hitler's last "election" where the ballots had a place to vote for der Fuehrer but there was no other candidate.

In a similar manner, in a recent NLRB election in an eastern food plant, the ballot merely asked if the worker chose a certain union to be his bargaining agency. What else could the worker do but say "Yes"? To him it appeared that it was only a choice between the union or nothing. Obviously he would choose the union.

In politics it is an old principle that you can't beat something with nothing. A NLRB election is a form of political expression and it is only fair to the worker, who has been led to expect much under the present Administration, to present him two tangible alternatives. When he has these alternatives, he has a choice. Lacking them he votes for whatever is offered that appears likely to better him.

It should be kept in mind that employers have no voice in naming the candidates on the ballot in NRLB elections. The board has that function. If there is no competing organization, whatever union happens to be active, whether it be the C.I.O., or A. F. of L. union or the successor to the employee representation plan, it will be the *only* name on the ballot and a majority vote for that union is practically assured. Because, if the choice lies between something (an organized bargaining agency) and nothing (no bargaining agency) the workers will choose "something" every time.

# *Cooperation*

# SAVES POWER COSTS

***Tie-in of packing company power requirements with public utility saves on electric current, while supplying all process heat***

**By H. S. FREDERICK**
*Application Engineer Westinghouse Electric & Manufacturing Co., Chicago, Ill.*

KINGAN & COMPANY, Indianapolis, in January, 1937, put into operation a thoroughly modern power system that emphasizes the trend of cooperation between utility and industrial companies to effect savings. Costs are reduced by the generation of power on the most efficient steam cycle consistent with the heat requirements of the plant. The substantial annual saving is expected to pay the total cost of installation in four or five years, and quality of service excels that offered by alternative methods.

The pressure of competition under which business is done provides a constant stimulus for every enterprise in the packing industry to reduce such costs as are within its control. This incentive to reduce costs was especially emphasized during the depression and many companies made intensive investigations of their operating costs.

The investigation made by Kingan & Company revealed that the processing costs were in line, but that the power costs exceeded those of similar plants. It was also found that the power costs were a large part of the production cost. To reestablish its competitive position it would be necessary to employ a more modern method of power production.

The method of power production most desirable would have the following characteristics:

1. It must be economical, so as to allow continued operation of the plant on an improved profitable basis.

2. Continuity of service is of even greater importance than in most industrial plants because the product under process is perishable in all stages of its manufacture.

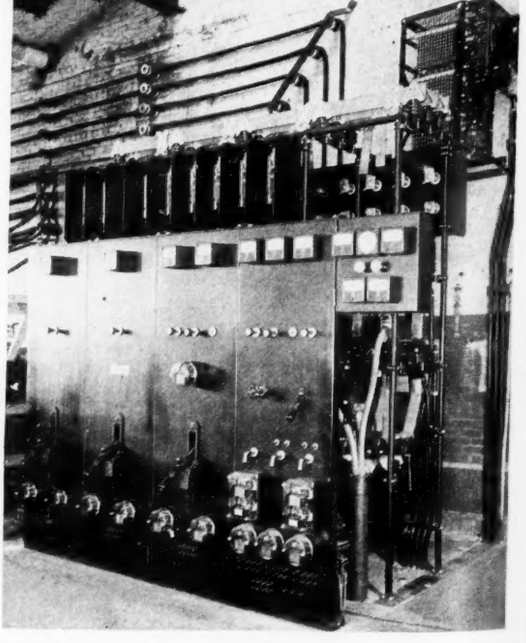
3. Steam is required at different pressures to drive engines, cook and process meat, and heat water. The method which would most efficiently provide steam at these pressures would have a great advantage.

4. The method must be flexible in its operation to be adaptable to the varying hour-to-hour conditions and to possible future conditions of the plant. The electrical load and the demands for 125 lb., 60 lb. and 8 lb. steam, all fluctuating independently, must be satisfied simultaneously and without waste.

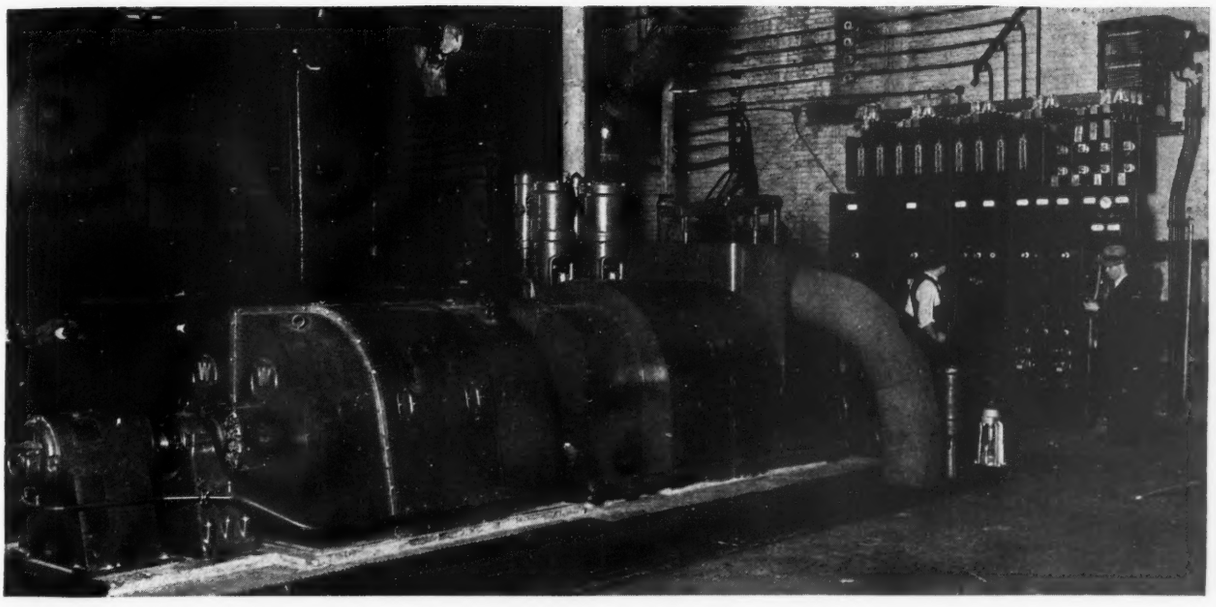
The plan selected not only met the foregoing requirements on each of the four points, but offered the important advantage of eliminating coal and ash handling and smoke from the plant. This plan consisted of purchasing both steam and power from the Indianapolis Power & Light Company.

The combined electric and steam service was made available by the installation in the Kingan plant, by theIndianapolis Power & Light Company of a new 2,000 kw. noncondensing, double automatic extraction turbine generator unit. The unit operates in parallel with the Indianapolis Power & Light Company's electrical distribution system, its speed being set by the frequency of the system. Within the limits of its capacity more or less primary steam is admitted to the turbine as required to give the extraction flows needed. Steam is passed through the turbine only within the electrical requirements of the plant.

When more low pressure steam is required than is given by the electrical demand, the turbine is by-passed through a desuperheater and reducing valves to the required pressures.



**A four-panel switchboard controls all 2,300-volt circuits in the packing company plant.**



**This new 12,500-kw. turbine-generator unit floats on the system of the Indianapolis Power & Light Co. and is controlled by a back pressure regulator supplying steam at 245 lb. plant header.**

Since the turbine governing system gives preference in turn to the lowest pressure steam demand, the maximum expansion possible is always taken through the turbine. However, the electrical demand usually exceeds that generated by the expansion of the required steam to the process pressures and the remainder is supplied from the Indianapolis Power & Light Company's system.

The primary steam comes to the turbine throttle through a 20 in. underground steam line from the power company's Kentucky Avenue plant, located approximately ½ mile away. New boilers supply steam at 625 lb., 750 deg. to a 12,500 kw. non-condensing turbine unit. This 12,500 kw. unit floats on the system and, under control of the back pressure regulator, supplies steam to the 245 lb. plant header. A desuperheater and pressure valve provides means of supplying the 245 lb. steam from the high pressure boilers in case the topping unit is down.

The electrical circuits are controlled by a 2,300-volt four-panel, switchboard which permits operation under the several conditions possible with this plant. The 2,500-kva. generator is controlled by an electrically operated oil circuit breaker to facilitate synchronizing with the power company's line, and is protected by reverse current and ratio differential relays. The power company tie line and feeder circuits are controlled by manually operated oil circuit breakers and protected by induction type over current relays. Hook stick operated disconnecting switches permit isolating the oil circuit breakers for inspection and maintenance purposes.

A flow of power back into the Indianapolis Power & Light Company system is undesirable. To hold this feed back to a minimum a directional power relay on the incoming line panel sounds an alarm in event of power reversal. The operator then readjusts the amount of load carried on the turbine to the point where no feed back occurs.

This joint turbine installation by Kingan & Company and the Indianapolis Power & Light Company is a striking example of how benefits of by-product power can accrue to both the industrial plant and the utility. The power generating possibilities peculiar to an industrial plant can many times be more completely realized when the resources of a utility are made available to the installation.

---

▶ ***While the application described here was made in a meat packing plant, experience in many manufacturing operations shows the method to be one that can be modified to be applied in any plant where there is considerable demand for both electricity and steam. Among food plants of this type are those making***

**Bakery Products**
**Beverages**
**Canned Foods**
**Chocolate Products**
**Confectionery**
**Meat Products**
**Sugar**

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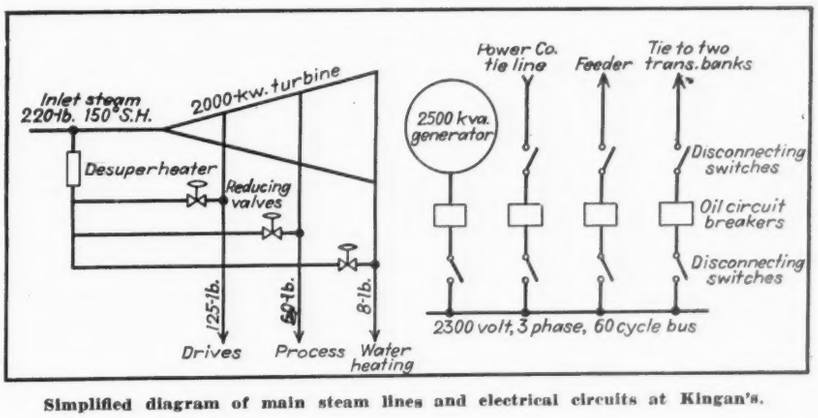
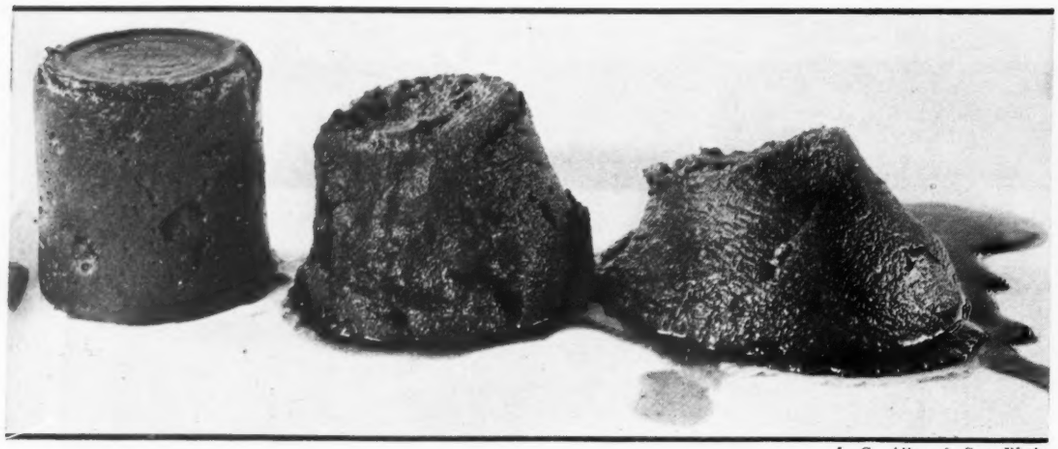



**Simplified diagram of main steam lines and electrical circuits at Kingan's.**



J. C. Allen & Son Photo

**Buyers usually prefer the dry canned pumpkin shown on the left. Nevertheless there is more of the original pumpkin in the wet pack shown on the right. Pressing the wilted pumpkin will eliminate much of the surplus juice and give a product like the center picture, or even dryer. But juice removing operations have the effect of complicating the spoilage hazards.**

# How Equipment Affects SPOILAGE of CANNED PUMPKIN

**By E. J. CAMERON**
*Assistant Director of Research Labs., National Canners Association, Washington, D. C.*

IN NO OTHER PRODUCT STUDIED by our laboratories have we encountered such a variety of equipment and methods as are utilized in the production of canned pumpkin. Everything from simple to very complicated procedure is followed, and the diversification of equipment is remarkable. Hence our study of spoilage problems relating to pumpkin canning has been made difficult, for there is very little in the way of standardized practice in the canning of this product.

A number of sources of contamination have, however, been now cataloged and we know which of them are most important as spoilage hazards. Although some of these hazards have been previously described in other publications, they will be reviewed again in the following discussion.

Of the various methods of handling pumpkin during its preparation, there are six methods based on the system of wilting or steaming the pumpkin which are supplemented by three other methods of treatment after the wilting has been performed. The latter are to remove surplus juice so that the pumpkin will have the proper consistency.

So far as discussion of spoilage hazards is concerned, it is proper to begin with the wilting method, because prior to this point we have not observed anything which has a direct bearing on spoilage matters.

## *Classification of pumpkin systems*

### Based upon wilting method

1. Wilting in retort, usually followed by pressing individual batches.
2. Wilting in metal boxes, a batch method followed by a continuous press of inclined belt or screw type.
3. Wilting in wooden boxes, a batch method followed by a continuous press of the inclined belt or screw type.
4. Metal or wooden wilting towers, batch systems similar to Nos. 2 and 3, with the exception that the wilting devices are of greater capacity.
5. Continuous metal or wooden box wilters, followed by a continuous belt press or screw type press.
6. Continuous metal tower systems, followed by screw type press.

### Based upon treatment *after* wilting

7. Pumpkin pressed and juice discarded.
8. Pumpkin pressed, juice concentrated and then returned to the batch.
9. Pumpkin cycloned or pulped without pressing and entire batch concentrated.

In discussing the foregoing systems of handling pumpkin, it should be fully understood that in this article they are appraised solely from the standpoint of bacterial contamination. There may be individual preferences based upon production considerations, but the problem here is solely the question of control of spoilage contamination.

Wilting in the retort, referred to as No. 1, followed by pressing the individual batches, is the simplest one studied. As would be expected, this simplicity of treatment and freedom from contact with contaminated equipment results in very low amounts of contamination.

When No. 2 is employed, the pumpkin is wilted in metal boxes. After the wilting operation is complete the batch is carried or conveyed

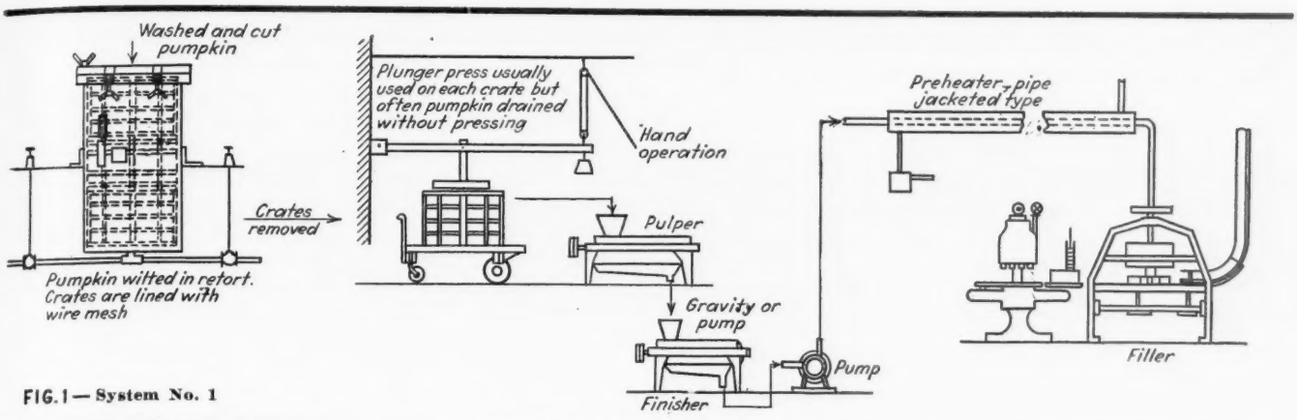



FIG. 1 — System No. 1

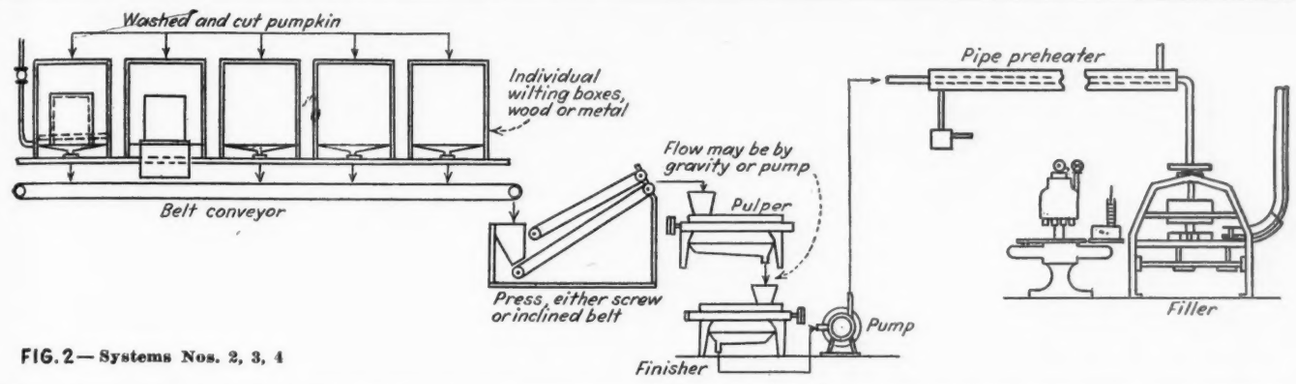



FIG. 2 — Systems Nos. 2, 3, 4

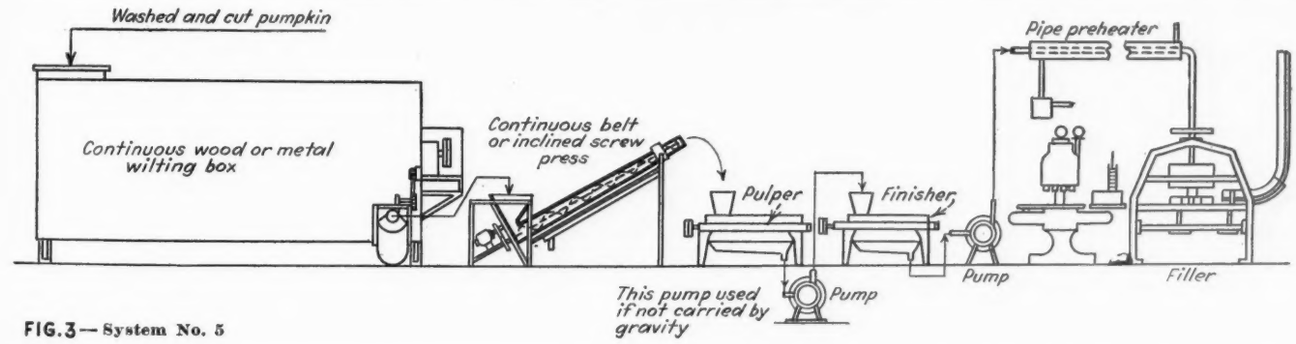



FIG. 3 — System No. 5

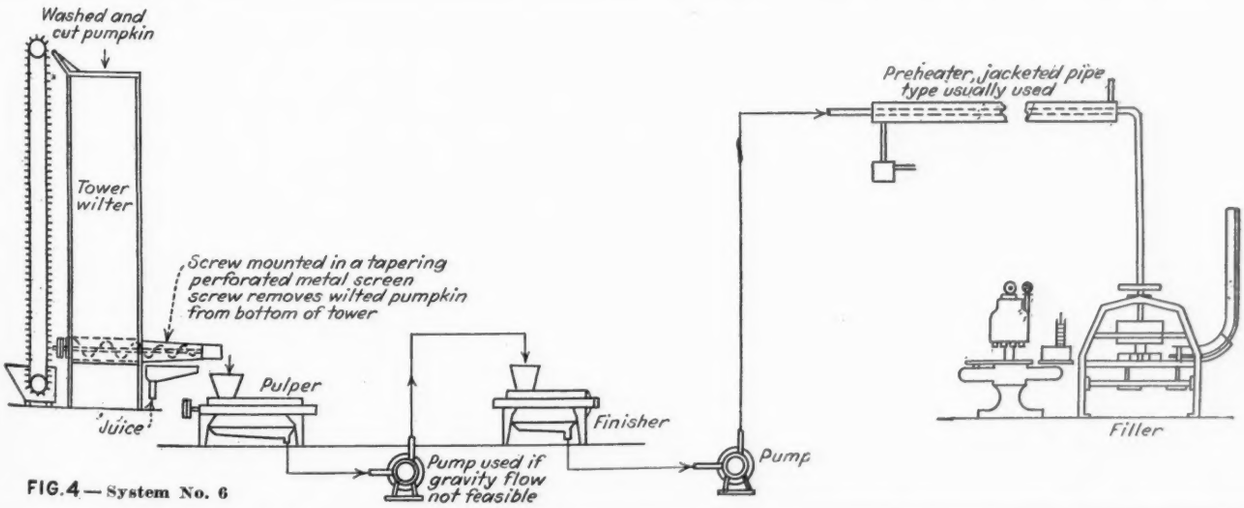

Washed and cut pumpkin
Tower wilter
Screw mounted in a tapering perforated metal screen screw removes wilted pumpkin from bottom of tower
Juice
Pulper
Finisher
Pump used if gravity flow not feasible
Pump
Preheater, jacketed pipe type usually used
Filler

FIG. 4 — System No. 6

**Fig. 1. System No. 1, pumpkin is wilted in retort and pressed in individual batches. Fig. 2. Systems Nos. 2, 3, and 4, wilting is done in boxes or towers, followed by continuous pressing. Fig. 3. System No. 5 uses a continuous box wilter and a continuous press. Fig. 4. System No. 6 uses a continuous tower wilter with continuous screw type press.**

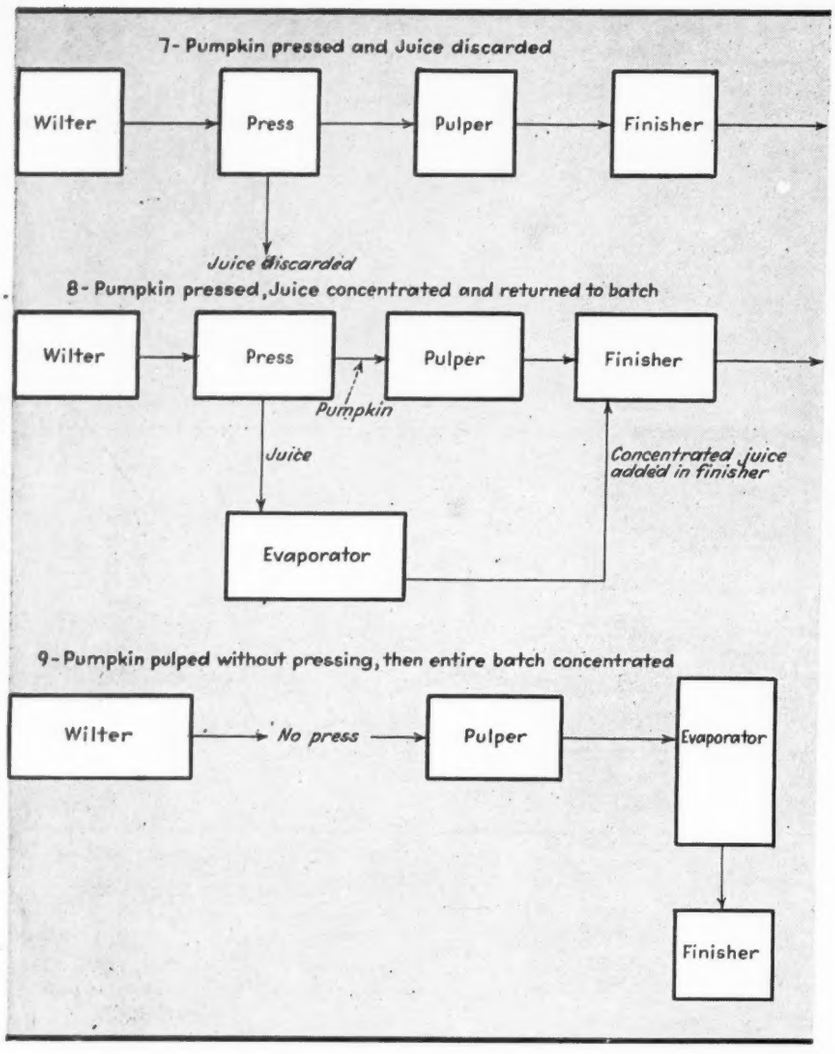



**Fig. 5. Systems Nos. 7, 8, and 9 are based on the treatment which the pumpkin undergoes after wilting.**

to a press, usually of the inclined type or the screw type, by means of which the excess juice is removed. There is nothing objectionable in the use of these metal boxes provided that all parts are accessible to cleaning. It should be carried in mind, however, that where steam is introduced through perforated pipes at the bottom of the box, these pipes should be blown out after the box has been cleaned. Otherwise they may carry a mixture of pumpkin juice and water overnight, or over a week-end, and this may serve as a medium for the growth of thermophilic spoilage bacteria. Thus when the next day's operations are resumed, the contaminated liquid within the pipe will be blown into the pumpkin being wilted.

Of the two types of presses previously mentioned, the screw type is much to be preferred from the contamination viewpoint. In a continuous inclined press, of which there are various modifications employing the same principle, the pumpkin from the wilter is dropped into a hopper and carried forward between two moving belts. These belts converge and the distance between them gradually decreases toward the outlet end. A pressure develops upon any pumpkin between and squeezes out the juice.

We have never failed to find thermophilic bacteria in the juice from this type of press. Although the machine may be well seeded with organisms coming from the wilter, there is a substantial increase in their number in the press itself because of the favorable temperature of growth in certain parts of the press brought about by the incoming warm pumpkin.

In the second, or screw type, press the wilted pumpkin is forced through a tapering perforated screen by means of a tapered helical spiral or worm. As a rule this equipment is readily accessible to cleaning and, what is also important, during operation the temperature of all parts of the press is so high (180 deg. F. to 200 deg. F.) that no bacterial growth is possible. From the viewpoint of those interested in avoiding and eliminating bacterial contamination the apparent increasing favor of the screw type of press is a matter of considerable encouragement.

System No. 3 differs from No. 2 by using wooden boxes instead of metal boxes for wilting. Because of our previous experiences with the undesirable results of wooden equipment in the preparation of vegetables for canning and also because of this pumpkin study, we do not hesitate to condemn the use of wood equipment in this particular service. Bacterial spores may become seeded in the pores of wooden staves and are likely to contaminate successive batches which will come in contact with the wood. For this reason the use of wooden towers or wooden boxes is hazardous. For some unascertained reason, we have not found that thermophilic bacteria are universally present in products which have come in contact with such equipment. But we have found them to be present in sufficient frequency to indicate that only hard surfaced equipment should be used.

Metal or wooden towers, involved in system No. 4, operated on the batch system, similar to No. 2 and No. 3, are subject to the same criticism from the bacterial contamination viewpoint that pertains to systems No. 2 and No. 3.

Further contamination hazards are found in No. 5, which involves the use of continuous metal or wooden box wilters. The difficulty here is that they are not at all adapted to proper cleaning and, after suspension of work, temperatures persist in them which favor the growth of contaminating bacteria for a period of hours. During this time there is an inevitable growth of spoilage bacteria and this accumulation serves to seed the organisms into next day's products. During cleaning operations these wilters may be washed out with water from a hose, but this frequently serves to make matters worse instead of better. The flow of water does not completely remove the food material, and it reduces the temperature of the wilter to a range which is favorable to the development of thermophilic spoilage bacteria. We have seldom failed to find high contamination in such equipment under these conditions.

The product from continuous tower wilters, system No. 6, is generally low in bacterial contamination. Nevertheless the remarks made in connection with the use of individual metal box wilters also apply here. It is very necessary to blow out the steam pipes each time after cleaning. And it is advised that provision be made for cleaning the equipment at least once for each 24 hour period, even if the plant is operating continuously 24 hours a day.

After the cleaned, sliced pumpkin has been steamed or wilted, there are three procedures which have been previously referred to as systems Nos. 7, 8 and 9. These methods cover the handling of the surplus juice. The usual procedure is No. 7. It has the advantage that most of the bacterial contamination which may be present is carried off with the juice which is pressed out. This statement is made without any reference to the possible disadvantages of loss of soluble nutrient materials.

The method of pressing out the juice, concentrating it by boiling and then returning it to the batch, previously described as system No. 8, is utilized by a few canners. From the contamination standpoint there is no objection to this procedure, provided that it is handled in such a way as to hold at a low level such contamination as may be present. If contamination is high, however, it is easily seen that instead of discarding contamination with the juice, as occurs in No. 7, it is concentrated and returned to the product—thereby augmenting possible trouble.

In the system No. 9, the pumpkin is passed through a pulper or cyclone without pressing, and then the entire batch is concentrated by evaporation. Here it is especially important to control the contamination factor as far as possible, because there is no way of eliminating any organisms which many enter the product. This procedure calls for some complexity in operation, also a great deal of attention to the equipment and all matters of cleanliness. These are of extreme importance.

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# *How to Get Copies of* FOREIGN PATENTS *from Washington*

PHOTOSTATS OF FOREIGN PATENTS can be obtained from the U.S. Patent Office in Washington, but one should not expect too much speed, and observance of a few rules of the Patent Office helps greatly in eliminating both delay and annoyance.

To order a patent one must know the exact charge which will be made for the photostats in order that he may remit by cash or money order. The Patent Office is not permitted to accept orders for work which have not been paid in advance, and remittances of stamps or personal checks cannot be accepted.

The charge for this work is 20 cents per page, or 20 cents for two facing pages when these can be reproduced with a single shot. Thus a six-page patent may cost either 60 cents or 80 cents, according to the page arrangement. For example, the 80 cents would correspond to an initial single page, two openings of two pages each, and a final page separately photographed. In some cases only the drawing of the patent is required, inasmuch as it may tell the story adequately. In that event, a single 20-cent photostat will suffice.

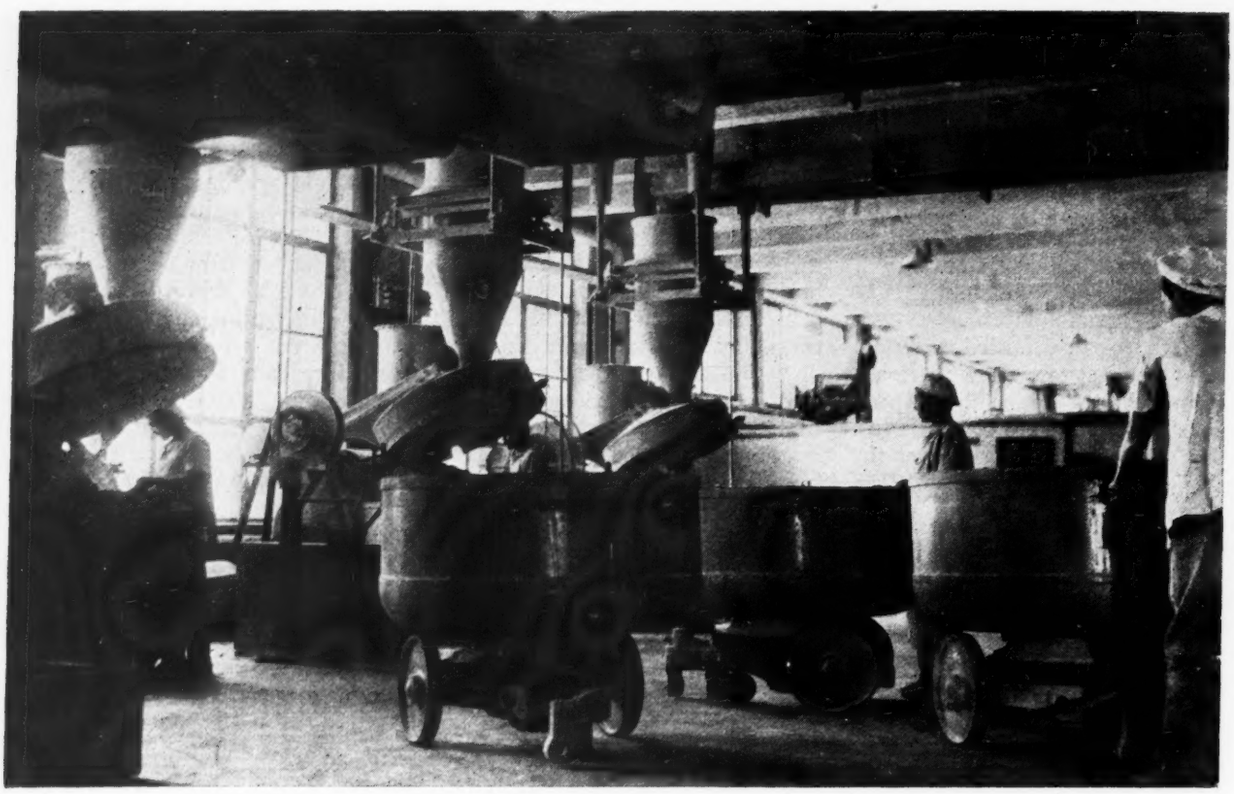
Where the number of pages of the patent is not known, and hence remittance cannot be made in advance, one wishing a foreign patent should write to the Patent Office for a cost estimate. This occasions some little delay, but apparently is unavoidable.

Orders received, accompanied by the correct sum of money, are handled through the Patent Office in about a week. When there is really urgent need, an order can be made "special," in which event, the photostats are ready for mailing in about three days. Such request for extra speed should, however, be reserved for real emergencies, or the inquirer is likely to have his requests for special action ignored.

Those wanting foreign patents should realize that all of them are in the original foreign language. Furthermore, in most cases the assignee or owner of the patent is not evident. Unfortunately, the U.S. Patent Office has no facilities for maintaining any record of the American ownership or control of foreign patents. Inquiries on such subjects must therefore, generally be made through a firm's patent counsel.

The U.S. Patent Office receives promptly patents from Austria, Australian Federation, Belgium, Czechoslovakia, Denmark, Germany, Great Britain, Hungary, Sweden, and Switzerland. From Germany, patents generally reach Washington within two to three weeks after issued. They also come promptly from Great Britain, in about a month after issue. There is a wide variation in the practice of other countries, so that no general estimate can be given for them as to the time between date of issue and reception in the United States. In some cases patents are not received here until from three to six months after their effective date.

Canada does not print its patents. To obtain a copy of a Canadian patent one must write to the Commissioner of Patents, Ottawa, Canada. An estimate is then sent which will permit remittance for the requested copy, which includes typewritten text and blue prints of drawings. As in the case of Washington, it is an advantage to have matters of this sort handled by patent attorneys resident in Ottawa, since they can make arrangements more promptly on behalf of a client, eliminating the time involved in correspondence. Most patent firms are prepared to render such service, but naturally include a substantial charge for the time of their staff that is required.



This Moscow bakery was mechanized during the first Five-Year Plan to produce 220 tons of bread each day

# MASS PRODUCTION

## *On a National Scale*

***Baking in Russia is state owned. Plants are centrally located to supply definite areas and are highly mechanized. Rigid technical control and systematized merchandising of the 350 varieties of bread and rolls produced are practiced***

FOR ABOUT TWENTY YEARS there has been considerable talk in the United States about the building of huge central and highly mechanized bakeries. In fact, during the 1920's there was a definite trend towards the building of large, high-production plants but so far nothing has been done on a scale camparable to the development in Russia during the last few years. There is a simple reason for this. In Russia, the baking industry is a state business. Competition between rival baking companies does not exist and the production of bakery products for city or region is centered in a plant built with a production capacity to supply that entire area.

In striking contrast to the thousands of primitive little bakeries which formerly supplied the Russians with their "staff of life," the Soviet Union's present bread factories are huge plants. Some of them employ as many as 600 workers on three eight-hour shifts in spite of the mass of machinery which makes output as nearly automatic as possible. Each factory unit has a laboratory fully equipped to make hourly tests of flour, dough, and the hot loaves which tumble down the chute from the ovens to the waiting delivery trucks.

This year, nineteen new mechanized bakeries will be inaugurated in Stalinbad, Frunze, Ishevsk, Kramatorsk, Ordjonikidze and other cities of the U.S.S.R. All these plants will be equipped with automatic conveyor ovens of Soviet manufacture. The total daily output of new plants will be 1,306 tons of bread and confections. In addition, a number of already existing mechanized bakeries in Moscow, Leningrad and other cities will be reconstructed and enlarged with the result that their daily output will increase by 2,000 tons.

Bread making and marketing in Russia was extremely crude before the era of the five-year plans. This picture shows how bread from a typical small bakery was weighed for delivery to peasant consumers

During the first Five-Year Plan bakeries became bread factories, and the shape of loaves and methods of handling were greatly changed

Following the putting into production of new plants and the rebuilding of the existing ones, the total daily output of all Soviet mechanized bakeries will reach 26,000 tons. This production is in addition to that of the bakeries not so highly mechanized.

According to I. Schechtermann, assistant manager of the Central Board of Bakeries, U.S.S.R., bread baking in Russia was largely a handicraft industry before the 1917 revolution. The industry was only slightly developed in the largest cities. Equipment of these bakeries was primitive and consisted of one or two ovens, kneading troughs, boxes and shovels.

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▶ ***High production rate, low production cost, effective technical and sanitary control over production operations and stable markets for products are the goals generally sought by industry. These objectives have been obtained in the Russian baking industry, and the methods used can be applied, at least in part, to***

**All Food Manufacture**

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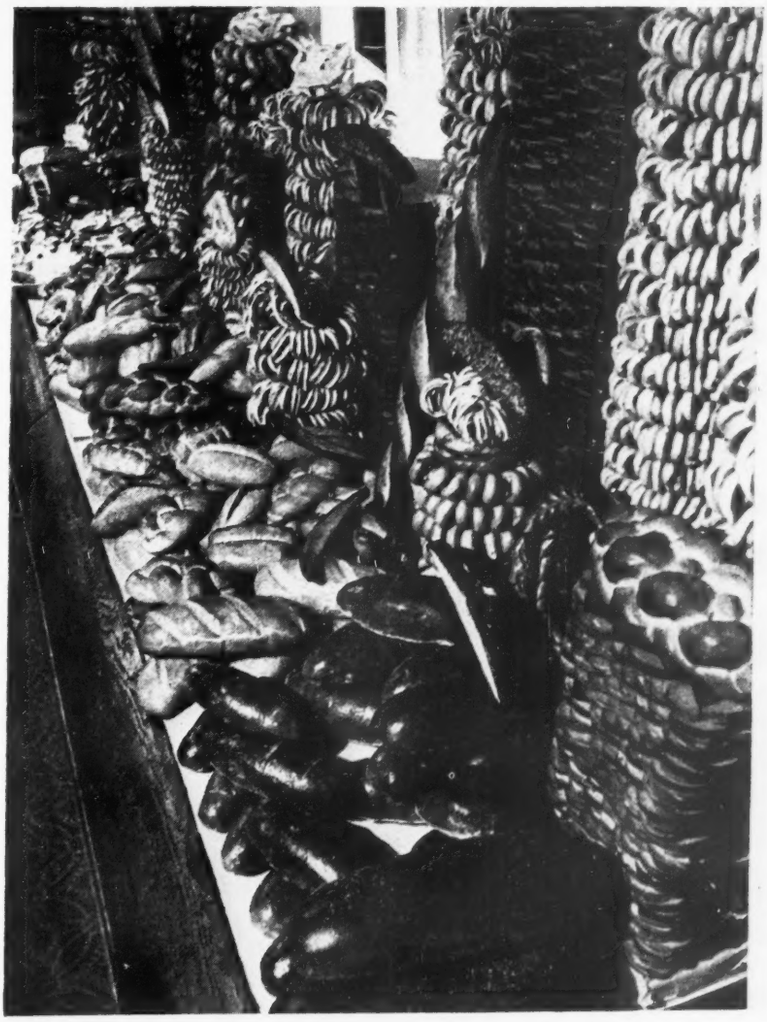


With the second Five-Year Plan near completion, more than 150 varieties of bread and rolls are now on sale in Moscow stores. Changes in the bread being sold typify the changes made in plant design and in manner of handling the output

Following the Revolution, particular attention was given to the reconstruction and centralization of the 10,000 small and widely scattered handicraft bakeries. In 1925, the Soviet Government drew up a large-scale program for the mechanization of bread baking and for the building of bread factories. In 1927, the first automatic factory was built in Leningrad. Two years later, (1929), one was built in Moscow. Both were equipped with foreign machinery.

SINCE 1932, the factories have been equipped with Soviet machinery. Now this state baking industry is made up of 1,524 plants with a daily production capacity of 30,150 tons of bread. Twenty-three of the plants are automatic, with a daily production capacity of 4,250 tons; 258 are large factories with a daily capacity of 13,125 tons; and 1,243 are mechanized and semi-mechanized plants with a daily capacity of 12,775 tons. Equipment in these plants consists of 5,644 ovens, 1,250 mixers or kneading machines, 485 dough dividers, 250 molding machines, more than 1,000 flour sifters, about 7,000 flour weighers, 15,000 pans, and 371 electric trucks or transporters.

These plants supply about 45,000,000 people in U.S.S.R. cities with fresh, assorted breads and rolls every day. In 1932, the poorer kinds of bread comprised 71 per cent of the total with wheat bread making up the other 29 per cent. In 1936, the percentage of wheaten and the best kinds of bread made up 74 per cent of the total; 350 different varieties of bread and rolls were made.

A measure of the growth of the baking industry in Russia is found in the monetary value of the basic equipment used. July 1, 1931, the total baking equipment in the industry was valued at 65,000,000 rubles by the Commissariat. On July 1, 1936, baking equipment in Russia was valued at 450,000,000 rubles; an increase of nearly 1,300 per cent. During 1936 the industry built 34 bread plants of which 11 are automatic. Half of these plants with a total daily capacity of 1,700 tons were in operation by the end of 1936. The other half will be completed in 1937 and 33 others with a daily capacity of 2,100 tons are planned for 1937.

An average daily production for an automatic plant is 185 tons. For large factories the average production is 50 and for other mechanized plants it is about 20 tons per day.

The latest discoveries of science are widely used in the Soviet bakeries. A scientific research institute has been formed and a 6,000,000 ruble special building with laboratories has been built. The annual expenditures of this institute are more than 2,000,000 rubles. In connection with this institute is being built an experimental machine testing station and an experimental bread factory with every existing type of equipment.

In addition to this institute there are 455 factory and regional laboratories in the bakeries to direct and control the factory operations and to carry on technical research work; 96.6 per cent of the products made in these plants are subjected to laboratory analysis.

The entire management of the bakeries is centered in 45 trusts covering various regions or republics to form branches of the Central Board of the Baking Industry of the Commissariat of Food Industries.

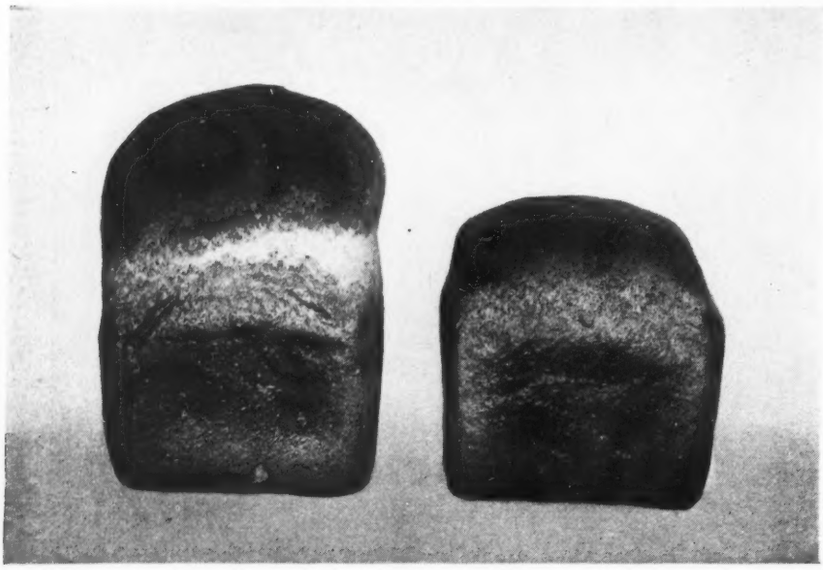
Training of the higher technical personnel is centered in the Moscow State Institute of the Baking Industry. Here are trained the engineers and technologists. In the four colleges in Leningrad, Sverdlovsk, Minsk and Odessa are trained the technicians. Over 30 factory schools train qualified workers and in addition over 60,000 workers are being given other technical training. About 20,000,000 rubles are spent every year on the preparation of personnel for the industry.

In spite of the increased mechanization and the use of automatic machinery, the number of persons working in the industry is constantly increasing; in 1936, the number of workers in the baking industry was 164,000 as compared with 60,000 in 1932. All the workers in the baking industry have a seven-hour day and during the last four years of the second Five-Year Plan, the wages of the workers in this industry have increased 72 per cent. In connection with the bakeries, there are a number of cultural institutions such as dining rooms, rest rooms, recreation rooms, clubs, sport and physical culture halls, nurseries and kindergartens.

The baking industry is faced not only with the task of organizing production but of supervising transportation to get the proper sanitary and hygienic conditions, and also of maintaining satisfactory sanitary and hygienic conditions in the retail end of the industry.

In Moscow, the whole output of the baking plant is transported in special auto trucks fitted up with special trays. Similar transport is being organized in Leningrad and in a number of other towns.

To develop and organize the sale of plain and fancy bread under the best conditions, the industry is building special shops in all the towns of the Soviet Union. At the present time the industry has about 500 such specialized retail shops and booths, which, in their equipment and variety of goods, are model shops.



**Loaves made in laboratory experiments to determine flour quality, a practice now standard under the second Five-Year Plan in the flour milling and baking industries**

*In the August number of* FOOD INDUSTRIES *will be published a description of one of the bread factories known as Moscow No. 5.—Editor*

# *New Problems in* SOCIAL SECURITY

***An interpretation of management, accounting, and reporting requirements, with special reference to seasonal food industry***

THE SOCIAL SECURITY ACT is now the adjudicated law of the land. Whatever doubt may have existed prior to May 24 was then eliminated by the Supreme Court.

Employers now pay taxes in three ways for the establishment of social security. Two new taxes are levied under the Social Security Act by the Federal Government, with a view to financing both unemployment and old age benefits. In practically all of the states, contributions are required to finance unemployment compensation. At present state laws do not provide for the old age earned type of benefits. There are, however, both in federal and many state laws, relief measures for the aged, and for other classes of persons, who have not yet had an opportunity to accumulate a benefit status under either federal or state laws for which the three sorts of taxes are levied. (Technically speaking, the federal taxes are levied to go into the treasury, and the disbursements are quite independent.)

In many respects, the requirements of law are similar for the three types of payments. Very fortunately, for all three types a simple and identical record of business transactions involving payroll or other compensation to employees will suffice for federal and state uses.

Reports have been simplified and regulations made so clear that in most particulars the average business man, without the aid of a lawyer, can do all the planning necessary for full compliance with law and regulation.

Every person who employs someone else to assist him in any business way is affected by the old age benefit portion of the law. And everyone who works for gain, unless a self-employer or engaged in domestic service, agriculture, or one of the other few exempted classes, will hope for old age benefit when he reaches 65. All of this matter of old age "pensions" is cared for solely by federal taxes, accounting, and payments.

No matter what form of wages, salary, or other compensation and remuneration may be given, the money value of this becomes, for the purpose of the Social Security Law, taxable wages. At the present time 1 per cent of such total compensation is deducted from the payment to the employee and another 1 per cent is added by the employer to make a 2 per cent remittance each month to the Collector of Internal Revenue.

A man who has only a part-time office helper or who employs a janitor to care for his place of business must pay such tax and make such report, just as does the employer of thousands of full-time workers. And the tax applies to the *first* $3,000 per year of compensation paid to such individual by any employer. If there be a salaried employee who gets $3,000 per month, then the tax applies to the whole $3,000 of the first month and the rest of the year's compensation from this employer to this individual is thereafter exempt.

If, as a part of his business, the employer furnishes housing, meals, or other advantageous thing or service to the worker, then the money value of that part of the remuneration must also be included as if it were dollars of wages.

For unemployment benefits, the manufacturer and his workers deal with both federal and state officials. Only three states, Florida, Illinois, and Missouri, do not have laws for unemployment compensation. The other 45 states, Alaska, and the District of Columbia, have approved laws; and Hawaii has a law which on June 7 was expected to be reviewed by the Social Security Board.

In general, the state law and regulations must comply with a general pattern of federal cooperation. Hence, basically the same facts are needed in all different states. The essential differences of report and contribution forms and times can be determined by each firm through consultation with the state officials.

So far as the Federal Government is concerned under Title IX of the Act, an employer is required to make reports and pay taxes only under certain conditions. The employer must have had working for him at least *one* day during each of twenty weeks a *minimum* of eight persons. This definition of exemptions, which applies only to reports and taxes payable by employers of eight or more, has confused a great many; similar exemption does NOT apply under many of the state laws. The fact of federal exemption must *not* be taken as proof of state exemption also.

FEDERAL AND STATE LEVIES for unemployment benefit are a business tax paid by the employer in an amount proportional to the payroll. Employers of eight or more report and pay the unemployment type of tax once a year. Most states require that unemployment reports and taxes be sent in more often, usually monthly, occasionally quarterly. The state authorities must be consulted for details.

Having these responsibilities to state and federal tax collectors clearly in mind, the employer is confronted with the problem of record keeping and accounting. Reduced to its simplest terms, this involves merely the keeping of a clear intelligible record of the names, account numbers, and amounts paid as remuneration to each person employed. If this record is clear, the rest of the job of accounting and reporting is not difficult.

Each employer long since has recorded himself as such with Uncle Sam; and his employees individually have asked for an assignment of a social security account number. Under the federal old age program each employee has and should keep personally his card certifying this number. But the employer must get from the employee knowledge of this number and must record it in his books for the identification of the individual and the correlation of his company rec-

(*Turn to page* 418)

**How the inside of a plant looks after the deluge. This mess is typical of scenes viewed by A.B.C.B. field laboratory men during a rehabilitation tour in the Ohio River valley after the big flood this year.**

By
**JOHN M. SHARF**
*Technical Service Director*
*American Bottlers of*
*Carbonated Beverages*
*Washington, D. C.*

# 50 Bottlers LEARN ABOUT FLOODS

As the recent Ohio River flood receded, the motorized field laboratory of the A.B.C.B. Technical Service began the work of rehabilitating submerged carbonated-beverage plants. More than 50 plants were given assistance in getting their products back onto the market in safe, merchandisable form.

Many of these bottlers were caught by the flood because they used as their index of possible high water the still-remembered level reached in the flood of 1913. No concerted effort was made during the slow rise to remove stock subject to damage by wetting. There were some, naturally, who at once made ready for the worst. Primarily, their thoughts centered on their office records, which were saved by moving them to a higher floor or to higher ground. Next came the stock of filled bottles, these being loaded on trucks and moved to another warehouse or, in some instances, stored in the open on high ground. At the same time, trucks were moved out of danger.

Raw materials, such as sugar, flavor, crowns and labels, all were handled in a similar manner. Empty bottles and cases usually were left in the plant, since they were less likely to be damaged by wetting.

Where time permitted, machinery was prepared by removing pressure gages, valves or measuring mechanisms and other relatively expensive removable units. Motors were removed or pulled to the ceilings with hoists.

Most of the actual damage was wetting and fouling, the latter caused by a very tenacious layer of water-deposited silt, in many instances made more disagreeable by an admixture of oil. Only in a few cases was the current so severe as to wash large amounts of the stock or plant away. The actual building structure suffered occasionally from undermining of foundations by water seeping through the walls. Interior plaster was cracked and broken. Unprotected windows inevitably were shattered. Wooden floors, unless of very sturdy construction, were warped by wetting and were beyond repair. Office fixtures were ruined completely, becoming unglued and losing all veneer. Even tightly closed safes suffered.

As was expected, all electrical circuits were shorted. Most of them had to be replaced, particularly power lines, motor starters, switch gear and meters. The water and drainage lines suffered little damage other than becoming full of sediment.

Submerged equipment filled up with muddy water and was coated with the slimy mixture of silt, oil and whatever happened to be in the locality. Much of this filth was removed easily if scrubbed away shortly after the water receded, but upon drying it became set so that very thorough scouring was necessary.

Several unexpected circumstances developed. Empty carbon-dioxide cylinders floated unrestrained and acted as battering rams, smashing windows, walls and other objects as they swirled around in the high water. Several types of bottle-filling machines which have large air chests became sufficiently buoyant to rise from their foundations, tear off connected lines and settle down in remote corners.

Relatively little sugar was submerged. In one instance, not so amusing to the owner, several hun-

dred sacks were piled on a platform, seemingly above the highest possible water level. The calculations were faulty by about 8 in., and as the bottom layer of sacks dissolved, the next layer was lowered into the water. The final result was a pile of empty dirty sacks containing only a few lumps of sugar.

In their hurry, most operators completely overlooked their stacks of labels, corrugated boxes and advertising signs. Turned to a pulpy mass by the water, these were a complete loss.

Submerged stacks of filled stock were covered with fifthy sediment. Practically all bottlers who lost stock in this manner wisely made no effort to reclaim it. They dumped the contents and chose to regain their loss by advertising products "free from suspicion," thereby promoting good will with their customers. Unfilled bottles and cases tended to float. And, where there was any appreciable current, these mixed themselves into a veritable "witch's brew," collecting at the same time the familiar coating of mud and oil.

Reclamation of the flood-damaged plants consisted basically in removing the accumulated filth and sterilizing process equipment. This required scrubbing, followed by flushing with plenty of water under pressure. In some plants, pressure steam was available to simplify the job. Chlorine solutions were used almost invariably for sterilizing. Windows were replaced where glass was available, and interiors and exteriors were brightened by scouring or repainting.

Submerged motors seemed to be quite satisfactorily repaired by baking. But from the appearance of the corroded copper and the damaged insulation, it was doubtful as to how long many of them would continue to operate.

The problem of washing bottles and cases involved manual scrubbing. The deposit on most of the bottles responded poorly to the treatment in the mechanical bottle washer, so most bottlers preferred to hand scrub with warm water. This was followed by a machine wash, employing the customary high-caustic-content alkaline solution. Cases were hand scrubbed, flushed, and dried.

***Sad experience taught beverage-plant operators along the Ohio what to do as the water rises and also as it recedes***

***▶While this article deals with means of minimizing flood losses in beverage plants, many of the measures described can be applied in***

**All Food Plants**

Since much of the sediment accumulated in the filling equipment was of abrasive nature, all moving parts, such as valves and gears, were dismounted and cleaned; the lubricant being replaced. This was particularly necessary on the complex water and syrup valves. Equipment manufacturers were extremely cooperative and had expert mechanics readily available in the field. Trucks which had their motors flooded required a complete motor overhaul and clean up.

Nearly every plant suffered some impairment of water supply, either through contamination of its own system or by failure of the local supply. Most of the river cities obtained their raw water from the river, and many of the local filter beds and pumping stations were upset. Even where the water supply was not of doubtful bacteriological purity, it carried taste, odors, increased chlorine content or sediment. Where there was doubt as to sanitary quality, a few plants employed super-chlorination and storage in the plant, followed by taste and excess chlorine removal by an activated-carbon filter. Many lesser installations controlled the excess chlorine problem in municipal supplies by similar carbon filters.

A.B.C.B. furnished every bottler in the flood zone a four-page detailed report covering the necessary steps to assure proper clean up. The recommendations were of the following general type:

1. Remove all sediment and accumulated dirt by vigorous scrubbing.
2. Flush thoroughly with water (preferably warm) until clean.
3. Flush with chlorine solution of not less than 100 parts per million and preferably 200 p.p.m., allowing a contact time of not less than twenty minutes.
4. Flush with potable water.

Most of the bottlers, in looking back on what they should have done before the water arrived, recommended the following general precautions:

1. Removal of all office records and fixtures to high ground.
2. Removal of all filled stock to points from which it could be continuously delivered during the interruption of plant operation.
3. Preparation of all equipment by removal of the more valuable parts and application of coat of grease to remaining machined surfaces.
4. Storage of empty bottles and cases out of imminent danger of washing away.
5. Removal of all raw materials, packaging, advertising matter, labels and so forth to high ground.
6. Removal of all trucks to safety and employment of them to bring in stock from other plants to meet the demand.

In short, keep the water from perishable products, supplies and equipment.

THE AUTHOR personally saw several interesting steps which might profitably be employed in future floods. In those instances where the foundations were undermined primarily by water seepage through basement walls, it would seem that allowing the water to rise regularly through the cellar drains, thus preventing any differences in level as against the outside, would be a preventive.

Similarly, plate glass fronts can be saved when the water rises rapidly by opening a door or breaking out a portion of the glass to equalize pressure. Large sections of plate glass are best battened, for floating articles invariably crash against them. Doors on roller tracks should be bolted down so that they will not rise on the water, disengage from the track and float away. All empty drums should be filled with water to prevent their floating. This also might apply to the air chests in filling machines. Gas cylinders should be tied down. Feed lines, pumps, filters, enclosed process equipment and what not should be filled with water and stoppered to keep out sludge. All wooden tables, racks or skids ought to be anchored.

Apparently the best grease to apply to machine parts is a tenacious transmission or axle grease. Long immersion and scouring action of the water will remove lighter products.

In the interest of fire prevention, gas and oil burners should be turned off to prevent the escape of gas and oil through the water and subsequent ignition at the surface. It is also wise to cut off electrical power except where it is absolutely necessary for emergency work.

Plants which depend on potable water for their processing certainly should be provided with sufficient heavy-duty filters to control sediment problems when the local supply is upset. Similarly, a taste and odor control unit would be warranted.

# STANDARDIZATION

## *Protects the candy batch from kettle to carton**

By **OTTO H. WINDT**
*E. J. Brach & Sons, Chicago, Ill.*

IN THE CANDY INDUSTRY, as in all food manufacturing industries, three elementary equations, shown on this page, summarize the complete production cycle.

Whether this production cycle results in a successful or an unsuccess ful effort depends upon the correctness with which each factor entering into these equations is selected and applied.

The watchword throughout this cycle is standardization.

To get the best results, standardization must start with uniformity in quality of raw materials and be coupled with standardized production procedure. Confections of uniform quality result.

Availability of suitable raw materials is the first essential in the manufacture of foods of which candy is rightfully classed in the high energy-giving group. From the available materials, satisfactory types must be selected on the basis of standards adopted to insure uniformity in quality of all raw material purchases. By so doing the candy manufacturer eliminates aggravating and expense-making variables from the already complex production cycle.

The control laboratory plays its part in the production of uniform quality confections because certain basic principles underlie all successful candy formulas. For this reason the production department through the control laboratory should be so well acquainted with the properties of the available raw materials that the necessary formula adjustments may be made to give confections having the desired textures, shelf-like qualities and other quality indicating characteristics.

Use of standardized raw materials and correctly balanced formulas are not the only safeguards in candy manufacture. Our goal of standardized candies will still be missed unless all batch ingredients are carefully weighed or measured.

Coloring and flavoring of candy batches is far from a "necessary evil"; correct use of colors and flavors is of utmost importance in maintaining candy quality. The most rigid system of dispensing colors and flavors is unquestionably through the plant laboratory and in quantities required for each batch. In many cases this method becomes too cumbersome. An alternative is the distribution of stock bottles of colors and flavors to the various departments. Under this less rigid system the candy maker, not the control chemist, is responsible for flavor and color uniformity.

IN THE ADHERENCE to formulas and correct batch "setups" the installation of rigid raw material control methods is gaining favor among progressive manufacturers. These control methods insure closer adherence to formulas and in that way insure greater confection uniformity. In addition definite economies may be made. The control is in effect a perpetual raw material inventory.

Daily checking of actual raw material consumption against the calculated consumption as indicated by the authorized formulas provides the management with an effective means for stopping leak losses. A further development in accurate raw material control methods is the installation of a system of batch control in which all ingredients are accurately weighed or measured for each candy batch. Standardization in this respect would necessitate the installation of a central raw material and distributing department. Such a department would deliver all raw materials in unit quantities to each department in strict accordance with scheduled production requirements; sugar, corn syrup, and water excepted.

IN THE HANDLING of liquid or fluid ingredient materials great strides have been made during the past few years through general use of automatic weighing and measuring devices. One precaution must be mentioned in regard to automatic weighing and measuring equipment—*periodic checking is imperative.*

In connection with standardization a few words on general sanitation are in order. In fact, batch protection must include strict cleanliness throughout the entire procedure of candy production taking in every step from the kettle to finished package.

Avoidance of foreign materials in candies is another factor in batch protection and is a problem of great importance. Raw material standardization includes thorough inspection to insure elimination of foreign substances. The installation of such safety devices as air-separators, electro-magnets and screens play a large part in the removal of foreign materials. Barrels and wooden cases should be opened in a guarded manner to keep nails, tacks, and bits of wood

1. Standardized raw materials + Balanced formulas + Accurate proportioning + Correct processing methods + Accurate supervision coupled with thorough inspection → ← Standardized confections of uniform quality

2. Standardized confections + Correct packaging + Right storage conditions + Intelligent sales effort + Good value → ← Consumer acceptance

3. Consumer acceptance → ← Repeat sales.

* Based on a paper read before the Production Forum of the National Confectioners Association Convention in Chicago on May 25, 1930.

from getting into their contents. Wherever possible glass bottles and graduates used for flavors and colors should be replaced with suitable unbreakable containers. Straining of candy batches through sieves of the smallest mesh consistent with good manufacturing practice is a good move whenever the nature of the batches permits.

ADEQUATE PROCESSING FACILITIES include steam supply, water supply, conditioned rooms, and mechanical equipment such as kettles, beaters, depositors, mixers, coolers, cutters, and similar production aids. Maintenance of all mechanical equipment in first-class condition must not be overlooked. Reduction of machine "breakdowns" to a low level results in greater batch uniformity. There are fewer "hold-over" periods to contend with, which in itself is a form of batch protection.

The processing steam supply need not be above 100 lb. per sq.in. pressure. The supply must, however, be uniform and dependable.

The cooling water supply must also be adequate and dependable. Slabs and other cooling equipment must cool uniformly. A further safeguard is a supply of conditioned air for such departments as hard goods manufacturing and packing and chocolate enrobing and packing.

The air in all conditioned rooms must be truly conditioned. It is essential that the established temperatures and relative humidities be uniform. Each manufacturer will have to determine for his plant the best conditions and see to it that the conditions are maintained to insure uninterrupted production of uniform quality confections. Recording thermometers and hygrometers should be installed in all conditioned rooms to serve as constant checks on operations.

All of us, I'm sure, recognize the importance of molding starch. Not all of us remember, however, that whenever molding starch is used it should be correctly conditioned. Under all circumstances molding starch must be clean, free from candy tailings, splinters, nails, and similar foreign materials. In addition it must be used at a definite temperature and have a definite moisture content when the confections are deposited. Molding starch conditioning must be varied for the different types of candies; best conditions for any given confection must be determined by each manufacturer to conform with his plant condition. Use of rotary dryers and coolers in combination with continuous reeling or screening, as well as use of conditioned rooms, help to provide molding starch possessing the correct characteristics for confectionery drying.

Thermometers, hydrometers, hygrometers, pressure gages, vacuum gages, refractometers, viscosimeters and other control or indicating instruments play their part in protecting the quality of the candy batch. All instruments used in the various departments must be accurate in their readings and should be constructed for easy reading by the technician. Continued accuracy is insured by mandatory periodic checking of all instruments.

IN THIS FIELD of product protection, the importance of effective laboratory control cannot be over-emphasized. Laboratory control starts with raw material standardization and inspection and follows through all phases of the production cycle of all confections in the modern candy plant. Laboratory checked process-control is one method for insuring product protection which is available to only the larger manufacturers. Through laboratory check control the efficiencies of starch dryers and air-conditioning systems, moisture content of finished products, fineness, viscosities and fat content of chocolate coatings and other helpful facts are determined and regulated to insure product uniformity.

Departmental supervision at each step in the manufacturing processing is essential. Extreme vigilance must be exercised by the supervisor to make certain that the specifications for a standard quality confection are met. Judgment must be used when departures from regular routine result from machinery breakdowns, steam pressure fluctuations, raw material variations, and other unexpected happenings.

Progressive manufacturers have a thoroughly organized and trained inspection force whose duty is the continual safe guarding of product quality. The head of the inspection department reports directly to the plant superintendent. Also he is directly responsible for the condition of all confections sent to the shipping room. In the performance of their duties the inspectors check the finished product as to texture, color, flavor, general appearance, finished counts, and similar quality specifications. The inspectors are also responsible for adherence to packaging specifications in reference to liners, dividers, partitions, net weights, and the like. No departure from established standards are tolerated without written orders from the superintendent to the department head concerned. Another responsibility of the inspection department is the periodic examination of shipping floor stocks.

THE FINAL STEP in candy production is packaging. Even at this stage there can be no let down on protective measures if confections of uniform standard quality are to be put on the market. Method and type of packaging which must be adopted for any confection is determined by the nature of the confection.

In at least one large Middle-Western candy factory all finished packages are subjected to extensive weather reaction tests before final packaging specifications are adopted. The test period is at least two weeks in duration. During this test period careful inspections of the candies are made at regular intervals.

In addition to an attempt to maintain the best atmospheric conditions in each package for the candy under test the package must have sufficient strength to withstand the rough handling to which it may be subjected in transit. The ability of the package to withstand a standard "handling" or "roughing" test is taken as an index to the effectiveness of the packaging system used. In this manner, the candy manufacturer may also determine what additional factors are necessary for the protection of the candies in the shipping carton.

While this general discussion has touched on the problems encountered in quality control and batch protection in candy manufacture there are numerous problems for each type of candy which have to be dealt with in a manner specific for that candy.

***▶Throughout all food manufacturing and processing there is a constant need for keeping a watchful eye upon the quality of raw materials purchased, upon the processing formulas followed, upon the type of equipment used, upon the checks and controls employed for correct processing, and upon the method of packaging adopted. All these points are dealt with in this article which is based upon principles applicable to***

**All food manufacture**

# Poultry Becomes a FINISHED

WIDE CONSUMER ACCEPTANCE of full-drawn "Ready to Cook" poultry promises a new era in poultry processing. Far-sighted poultry packers have looked forward to such an event for a number of years. It is now firmly believed that this method of preparing chicken, turkey and other classes of poultry has come to stay. Refinements in the technique of handling and the lowering of the processing costs of these products will, no doubt, help provide an extension of the present market for them.

In this relatively new means of preparing and handling drawn poultry, certain problems must be solved to improve the quality of full-drawn birds and to lower costs of operation. Efficient and economical labor costs have been achieved by assigning each worker specific duties. Piece-work pay has further encouraged rapid and economical unit handling through constant selection of labor particularly fitted to each operation.

The process is divided into five distinct steps: (1) Preliminary clean-up of the exterior of the bird, (2) evisceration, (3) government inspection and certification, (4) washing, internal cleaning and final check-up and (5) individual wrapping and packaging.

After the removal of the viscera through a small incision in the abdomen, the federal inspector passes on the bird. Any evidences of diseased carcasses are carefully checked, and rejected poultry is destined to a "little red bucket."

Water from high-pressure jets sweeps out every remaining trace of viscera and blood from the body cavity in the next operation. And after being scrupulously cleansed, each bird is subjected to a rigid final inspection. Excess moisture is then removed by careful draining followed by drying with clean, sterile toweling. If extreme care is not taken in this operation, droplets of blood-stained water are certain to collect within the transparent cellulose wrapping. This would give the package a most unsavory appearance and practically ruin its sales appeal.

The birds are next shaped in preparation for packaging. The hock joints are wrapped and tied to the tail to give a plump appearance. Wing tips are locked to form a triangle and the neck skin shaped to eliminate any unsightliness. Expertly trained girls then wrap each bird in a Cellophane sheet. Neatly and rapidly, nimble fingers shape this covering to fit the preformed carcass. The result is a display package par excellence, as may be seen in the accompanying illustrations. Full advantage is taken of the transparent covering to show off the poultry at its best. Truly it is ready to cook.

Six birds fit snugly into a special waxed fiberboard box, the design of which conveys the sales slogan. Automatic tying machines complete the operation, providing each box with two securely tied cords. The birds are instantly ready for display or inspection by one pull at the two slip knots.

After packing in the boxes, the birds are moved quickly to the freezer rooms, where the temperature is —5 to —15 deg. F. The boxes are staggered in the freezer for effective heat absorption and later piled compactly for the remainder of the storage period. After freezing, the poultry is ready for the consumer, who can have it ready to eat in a "jiffy."

The cost of all this preparation is not excessive, detailed though the handling may seem. Invariably, the housewife asks the butcher to draw the orthodox "hog dressed" poultry she has purchased. That the expense of having the butcher do this job looms large can be attested to by the fact that stores purchasing full-drawn poultry frequently find it cheaper to handle than the undrawn product.

Perhaps the greatest obstacle in the matter of increased costs comes from the 25 to 30-per cent shrinkage accompanying drawing. This shrinkage materially raises the cost per pound. A point well worth remembering, however, is that housewives generally buy a chicken, not pounds of chicken. A consumer will not hesitate to purchase a full-drawn fowl at $1.30 when an undrawn bird of similar size sells at $1.20. Present experience indicates that the better class of consumer gladly pays this small premium for the "Ready to Cook" bird.

Federal inspection is being used

**Neatly and rapidly, nimble fingers shape the transparent-cellulose wrapping to fit the pre-formed carcass of the bird. Previous to packaging, excess moisture is removed from the carcass by careful draining and drying with sterile toweling. This prevents collection of unsightly blood-stained water droplets under the wrapper.**

# PRODUCT

Appetizingly packaged in transparent cellulose, these full-drawn "Ready to Cook" chickens have gained wide consumer acceptance which promises a new era in poultry processing.

***Full - drawn, federally inspected and smartly packaged, "Ready to Cook" birds at reasonable cost open new vistas for the industry***

**By G. F. STEWART**
*Research Department*
*Omaha Cold Storage Co.*
*Omaha, Neb.*

because of a sincere belief that it pays. The removal of diseased and undesirable carcasses from the pack will result in an increased confidence and satisfaction that will repay all extra costs many times over. Farsighted poultry packers seriously expect compulsory federal inspection of all drawn poultry in the very near future. Our present practice provides valuable experience forerunning the forecasted change.

Technical problems involved in processing and handling drawn poultry naturally are all-important to the success of the venture. Desiccation during storage and distribution assumes about double the importance that it has in undrawn poultry. Besides unsightly "pocking" that results from desiccation, it has been shown that the skin fats become rancid, giving rise to undesirable flavors. The incidence of rancidity closely follows dehydration, according to present knowledge. This loss of moisture from the birds may be overcome by: (1) tight package design; (2) moisture-proof treatment of package materials and liners and (3) humidified freezers. One or another of these methods, depending on conditions under which the birds move to market, may be used to advantage.

Byproduct disposal remains a problem as yet unsolved. When one considers that the average waste is 25 per cent, the significance of the problem is at once apparent. Fertilizer and tankage as outlets have not as yet proved successful because of insufficient tonnage. Retrieving the valuable endocrine glands at a profit also remains for the future. A study of the potency of glands from this source is now in progress and will throw light on this possibility. Pickled cocks combs and kidneys may provide an additional outlet for now worthless byproducts.

Much has been said about marketing drawn poultry. The majority of the industry has contended, as a result of early experimental work, that drawn birds should be retailed only in a frozen condition. Without a doubt this would be ideal. Nonetheless, consumer reaction is strongly against frozen foods in certain sections of the country. Then too, few retail stores are equipped to handle frozen foods. Recent experience has amply demonstrated that drawn poultry, processed under rigid sanitary conditions, may be defrosted and marketed in this condition. Incidence of spoilage has been practically nonexistent. In fact, one retail organization has handled all of its drawn "Ready to Cook" poultry in this manner with good success.

Drawn turkeys are enjoying a popularity equal to that of chickens. The process of handling turkeys is entirely similar to that of chickens except for packaging and the removal of leg tendons. Each turkey is placed in its individual retail package. Because of their large size, turkeys may be processed at a somewhat lower cost per pound. Drawing shrinkage is appreciably lower, contributing also to small per pound increases due to preparation. There is little doubt but that drawn turkeys will largely replace undrawn ones in the very near future. This move will be possible because a product like turkeys can easily carry a small selling premium without adverse consumer reaction.

# MIND YOUR PAINT

***Results of tests reported here indicate that paints may be selected as an aid in bacteria and mold control work as well as for appearance and for protection of surfaces***

**By S. S. EPSTEIN**
*Germ Proof Paint Co., Brooklyn, N. Y.*

EACH YEAR food manufacturing industries suffer heavy losses through spoilage of products by the action of microorganisms, such as bacteria, molds and yeast.

Some factors influencing spoilage of foods involve the physical and chemical properties of the food in question, such as moisture content, hydrogen-ion concentration (pH) and specific chemical composition. Other factors are conditions of production, storage and distribution. In general, poor housekeeping which contributes to unsanitary conditions of production is the underlying cause of bacteria and mold infections in food plants.

During recent years air filtration, washing and recirculating systems have been installed in food plants to free the air of microorganisms. Such practice indicates recognition of the important role played by the air as a source of contamination. Plants equipped with such devices have reduced losses caused by microorganisms but not to the extent desired. Walls, ceilings and floors, as well as equipment, have a contributing part in causing spoilage through bacterial and mold contamination.

This statement is supported by the fact that mold contamination threatened a manufacturer of margarine with economic ruin until changes were made in the conditions of production.[1] One of the effective steps taken to reduce the spoilage involved the daily clean-up of all equipment, walls and floors with sodium hypochlorite solutions at a concentration of 100 to 200 parts per million.

The result obtained by this treatment is not surprising when one reminds himself that mold growths are frequently seen on walls and ceilings in food plants, especially in fermentation and storage rooms. In such instances, certain ingredients of the paint serve as foods, support life for the mold. The forerunner of the mold growth which is visible to the naked eye is a mold spore of microscopic size, often less than 3 microns in its longest dimensions, (1 in. = 25,400 microns). Like a "seed" of any plant, the mold spore germinates and in its growth sends out branched threads along the surface to which it is attached and also in directions perpendicular to the surface. The threads along the surface form the "mat" of the mold while the threads perpendicular to the surface form the fertile "hyphae" giving rise to thousands of new mold spores, each capable of starting a new mold growth.

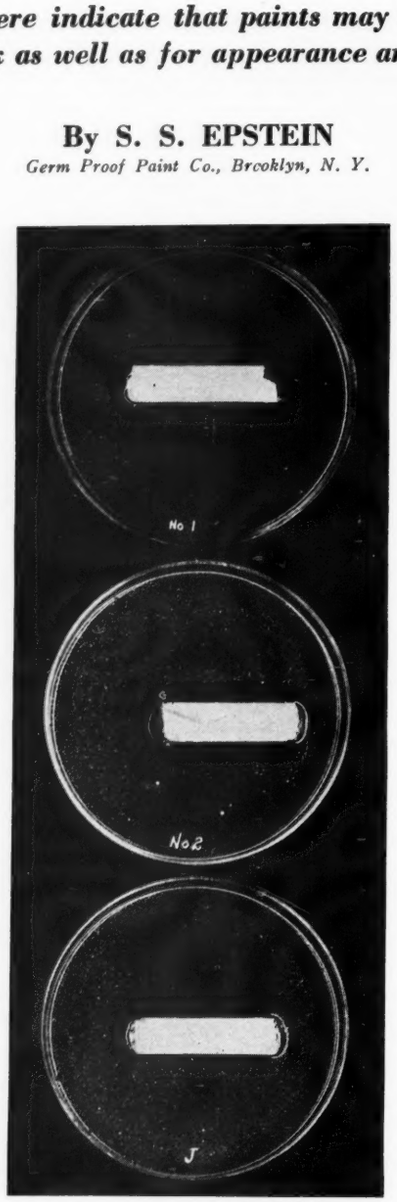



**Fig. 1—Glass rods painted with one coat of germicidal paints, No. 1 and No. 2, and of general-use commercial paint, "J," were dried 263 days and then incubated 48 hours at 37 deg. C. in nutrient agar plates inoculated with a 48 hour, sixth generation broth culture of Staphylococcus aureus. The clear areas surrounding the rods in Nos. 1 and 2 indicate that these paints not only retained germicidal properties after drying but also that the germicidal influence is diffused into the nutrient agar medium in which the glass rods are embedded. Absence of such a clear area surrounding rod covered with paint J indicate that that paint did not retain effective germicidal properties after the drying period.**

When paints were first introduced, they were applied to the interior walls and ceilings and industrial plants as well as to those of public structures, dwellings and office buildings. This practice was in part based on recognition that paints improve sanitary conditions because during the drying of oil paints, aldehydic substances are evolved which are destructive to microorganisms in general and to pathogenic bacteria in particular. For this reason, newly painted surfaces harbor but few microorganisms. But after drying for about a month, ordinary general-use commercial paints no longer exert any inhibitive effect on the development of bacteria and molds.

Observed indications are that many bacteria and yeasts can also grow on the surface of ordinary commercial paints, but because of the minute size of their growths, they escape the observation of the naked eye. Unlike molds, bacteria and yeasts grow compactly and adhere very close to the surface and even become imbedded in the material beneath the surface.

In the development of a germicidal paint, two methods for testing the germicidal properties of paints against *Bacillus typhosus* (*Eberthella typhi*-Hopkins strain) and a strain of *Staphylococcus aureus* obtained from a throat culture were employed.[2] In the first method, 0.1 c.c. of a saline culture suspension containing 500 million bacteria was spread out on an area 1 in. square of painted tin disks after drying for one, three, six and fifteen days, for three months, and for three to four years. The disks were then placed in petri dishes containing a layer of

filter paper moistened with 1 c.c. of sterile water to maintain a high humidity. After 24 hours of contact of the bacteria with the paint, the area was rinsed with 1 c.c. sterile saline solution and a definite amount of the rinse was transplanted to a tube of sterile broth and incubated 48 hr.

In the second method, 10 m.m. painted rods after drying for one, three, six, fifteen and thirty days were immersed in test tubes containing 4 c.c. of saline solution and 500 million typhoid bacilli for six hours after which time the painted rods were removed and 0.2 c.c. of the culture suspension transplanted onto agar medium and incubated for 48 hours. Failure of growth in the broth or on the agar were considered indicative that the paints used had bactericidal qualities.

The results of these studies, indicated that ordinary general-use commercial paints (35 tested) are only temporarily germicidal and lose such property after drying periods of one to three weeks, whereas a paint having a 4 per cent halogenated oil as a base has a bactericidal effect on the two types of bacteria even after three to four years of drying.

Other studies[3] using essentially the same test methods on the halogenated oil type of paint after prolonged periods of drying have been made in comparison with a number of ordinary general-use commercial paints. The cultures used for testing were *B. typhosus* (Hopkins strain) and 4 strains of *Staphylococcus aureus* including No. 209 (U.S.F.D.A. strain). Experimental results showed that halogenated paints after air-drying for nine weeks and after baking for six hours at 125 deg. C. (an approximate equivalent of six years of air-drying) exerted a marked bactericidal effect upon saline suspensions of *B. typhosus* in the test tube, as judged by the lack of growth on the agar plates while none of the ten general-use commercial paints tested were very effective after a shorter drying period of six to seven weeks.

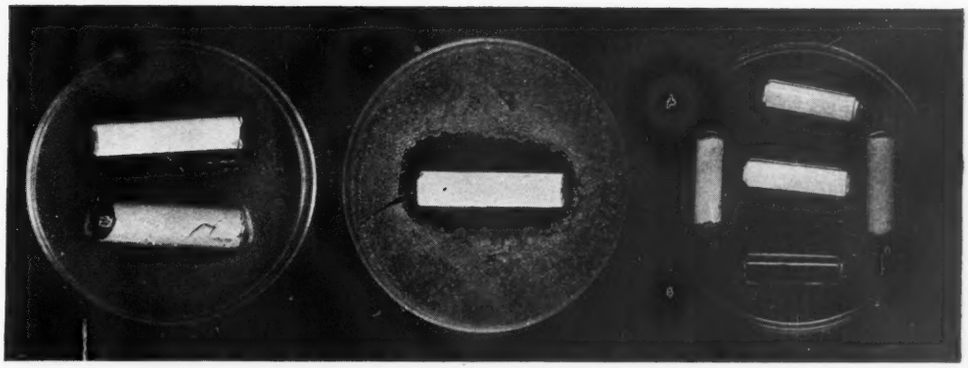


**Fig. 2—Effect of germicidal paints upon resistant spore-producing bacteria is evidenced by the clear areas surrounding glass rods painted with germicidal paints dried from 24 to 29 days and then incubated from 24 to 144 hours at 30 deg. C. in nutrient agar heavily seeded with various strains of *Bacillus mesentericus*. The rods not having clear areas surrounding them are both unpainted controls and test rods with general-use paints.**

Results with *Staphylococcus aureus* No. 209 were not as consistent as with *B. typhosus*. In 16 and 15 experiments out of a total of 22 for each paint halogenated paints "A" and "C," respectively, were strongly germicidal. Preliminary work on slight modifications of paints "A" and "C" showed encouraging results with *Staphylococcus aureus*.

The discrepancies of the results have been explained on the basis of uneven distribution of organisms in the saline solution and consequent formation of many large agglomerates. The strength of the culture suspensions used in the second set of tests was from 15 to 150 million per c.c. In our opinion the tests employed were much too severe. Test tube experiments with much lower concentration of organisms are in progress.

Based on the agar-plate method recommended by the United States Food and Drug Administration[5] for testing antiseptics and disinfectants in such products as salves, dusting powder, creams, plaster, and the like, an ingeniously simple procedure has been worked out for comparing antiseptic properties of paints. Details of this method are to be published in the near future. For the present it is enough to say that 20 per cent sterile agar medium, melted and cooled to 43 deg. are inoculated with 0.1 c.c. of a 48-hour broth culture or a saline suspension of *Staphylococcus aureus* or *B. typhosus* and the seeded agar poured into a sterile petri dish. Just prior to solidification of the seeded agar, a glass rod (40 m.m. in length and 11 m.m. in diameter), painted and air-dried for a stipulated period of time, is imbedded in the center of the plate. Incubation is at 37 deg. C. for 48 hours after

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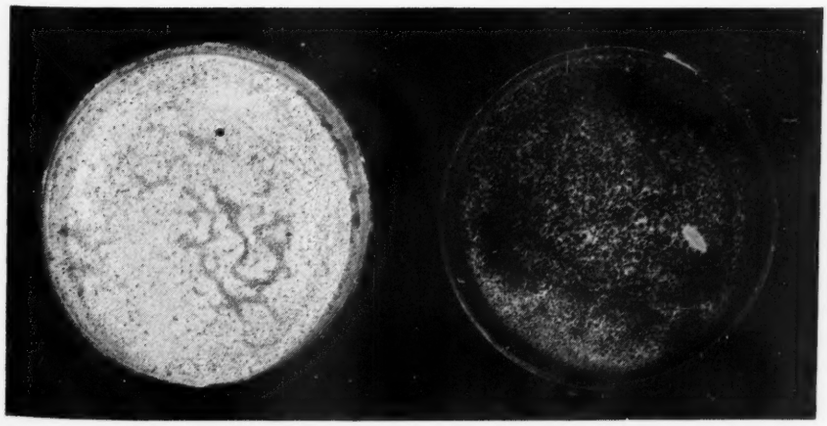

**Fig. 3—Susceptibility of molds to the germicidal properties of paint is shown in the case of two Petri dishes which have been painted on the inner surface one with a coat of germicidal paint and one with a coat of general-use paint, dried for thirteen days, charged with nutrient media heavily seeded with *Aspergillus niger* spores. After sixteen days incubation at room temperature no growth developed in the plate on the left coated with germicidal paint. The mold grew luxuriantly in the media in the plate on the right coated with a general-use commercial paint.**


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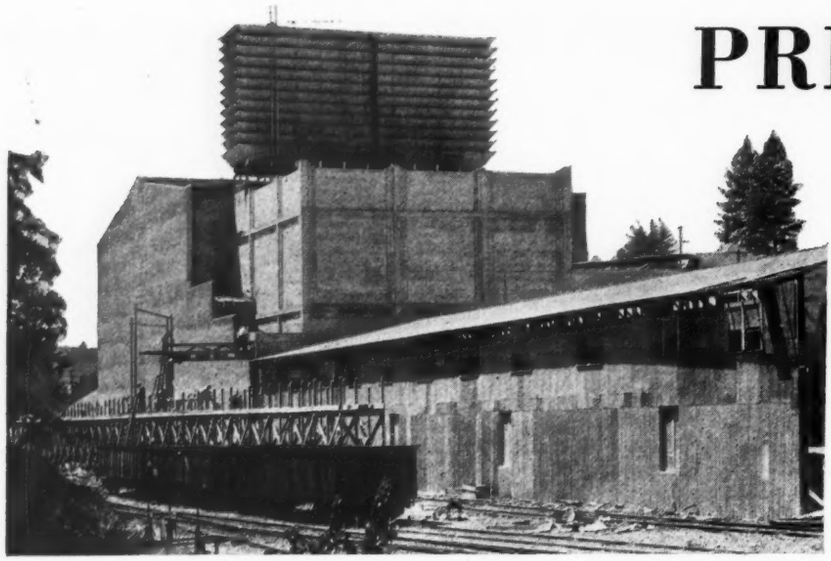


New cooling and storage plant for deciduous fruit, built by Placerville Fruit Growers' Association

# PRECOOLING *at a Profit*

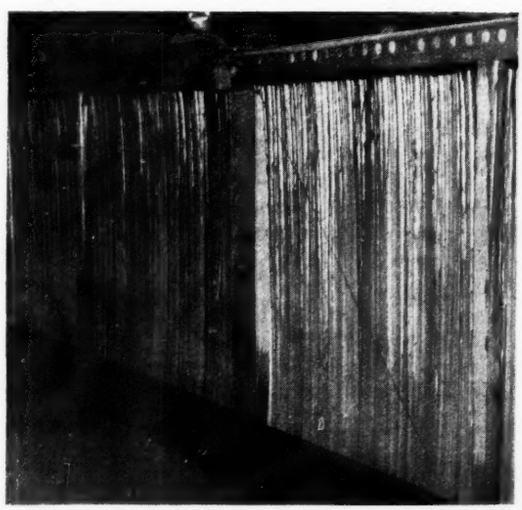
***New cooling system and efficient handling improve quality of fruit, effect savings in shipping costs and change marketing methods.***

THAT QUALITY, MARKETING METHODS and prices can be improved through intelligent food engineering has been demonstrated by Placerville (Calif.) Fruit Growers' Association. The association's new ultra-modern plant for precooling and storing deciduous fruit has effected many benefits. It has produced a better product that commands top prices. It has extended the shipping season and enabled the maintenance of a more uniform price structure. It has cut spoilage to a minimum. And lastly, but of first importance, it has been quite successful financially.

The pear is one of the most perishable of fruits. As jobbers demand that pears reach them green, previous practice has been to pick immature fruit, deficient in sugar content. This has been eliminated by the new plant, since ripening is arrested by cooling within a few hours after the fruit has been picked. This makes possible the maximum development and weight of the pear on the tree. And when the precooled fruit reaches the market, it is crisp, full and firm, remaining in the "eating ripe" condition two or three times as long as that handled in the usual way.

The older method of precooling fruit en route in refrigerator cars, and then renting public storage, with the attendant expense, has been made obsolete. The new plant permits storage at Placerville and allows shipments to be spaced to conform with best market conditions.

The investment in the plant which produces all these advantages is being retired out of savings. With the fruit thoroughly precooled, it has been found satisfactory to load 37,200 lb. per car and to use only the initial icing for refrigeration en route to market. This effects a cost saving on pears reaching the Eastern market sufficient in itself to retire the full plant investment within a few years' time. Premiums to growers have provided them an additional return of not less than 35 per cent.



New type of air-conditioning unit. Chilled brine flows in thin films over vertical sheets of cloth, and air is blown between the sheets. In addition to conditioning the air for temperature and humidity, the unit scrubs it to remove dust and mold spores, and also takes out carbon dioxide and ethylene

The precooling system, which involves a new method of controlling temperature and humidity and of removing dust, spores, odors and toxic gases, is housed in a plant adjacent to the packing house. The precooling plant itself is five stories (70 ft.) high, 105 ft. wide and 137 ft. long. Filled to capacity, it will hold 230,400 boxes of fruit, and it has a daily precooling capacity of 20,000 boxes, with a maximum time for complete precooling of 72 hours.

Of mill-type construction, the building walls include 6 in. of redwood-bark insulation. Extending

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▶ ***Even the handling of fresh produce involves the use of considerable food engineering. How the proper technical handling of a perishable has permitted more profitable selling alone would justify this article. But the new method of controlling temperature, humidity and purity of air is something that meat packers may want to look into. Hence this tale should be read by***

**Canners**
**Meat Packers**
**Produce Handlers**

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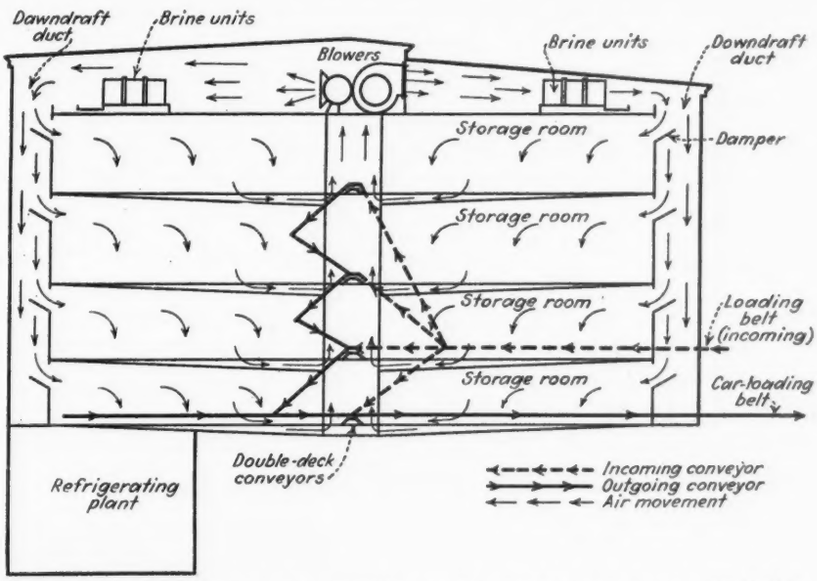
along one side is a loading track accommodating eighteen cars which are loaded through conveyor openings in the wall. The lower four floors are devoted to either fruit storage or precooling, depending upon the season. Each floor is divided into ten rooms (five on each side of the central corridor), each room being 60 ft. long, 19 ft. wide and having a capacity of 5,760 boxes.

Precooling is accomplished by a special system designed and patented by Paul A. Scherer, of San Francisco. Chilled brine is pumped to the top floor, or "brine loft," where there are 84 heat-transfer units. Each of these units consists of a redwood framework from which is suspended a series of cloth sheets spaced about 1 in. apart. Each unit contains 112 sq.yd. of cloth. Through headers at the top of the frames, chilled brine flows downward over each sheet, forming a thin film and a large cooling surface. The brine then passes into a floor sump, through a shallow sand filter, back to the ammonia-refrigerated brine cooler and again through the cycle. The air circulated through the precooling rooms is forced under approximately $\frac{3}{8}$-in. (water) pressure between the wet cloths, where it comes in contact with the cold brine.

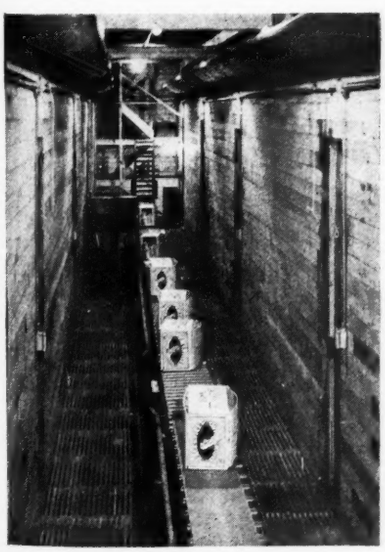
The extremely large cooling area provided by this design permits a close temperature split between the air and brine and also insures a high humidity. Humidity is controlled within limits by regulating the saturation of the brine. The intimate surface contact of air and brine also results in efficient scrubbing of the air. Dust particles and fungus spores are removed. No spread of mold has been observed in the plant during the two seasons of operation at the high humidity required. The carbon-dioxide concentration in the air is regulated through control of the hydrogen-ion concentration of the brine. In spite of the large volumes of carbon dioxide generated by the fruit, concentrations below atmospheric levels are maintained. And the brine also absorbs toxic gases, such as ethylene, these being oxidized by chemicals within the brine; it seems probable that the removal of ethylene is largely responsible for the remarkable storage records which have been established on peaches and bartlett pears in this plant.[1] Odors also are absorbed by the brine.

The precooling refrigeration load is carried by a three-unit, 225-ton ammonia-brine plant. And there is an ice plant with a capacity of 60 tons

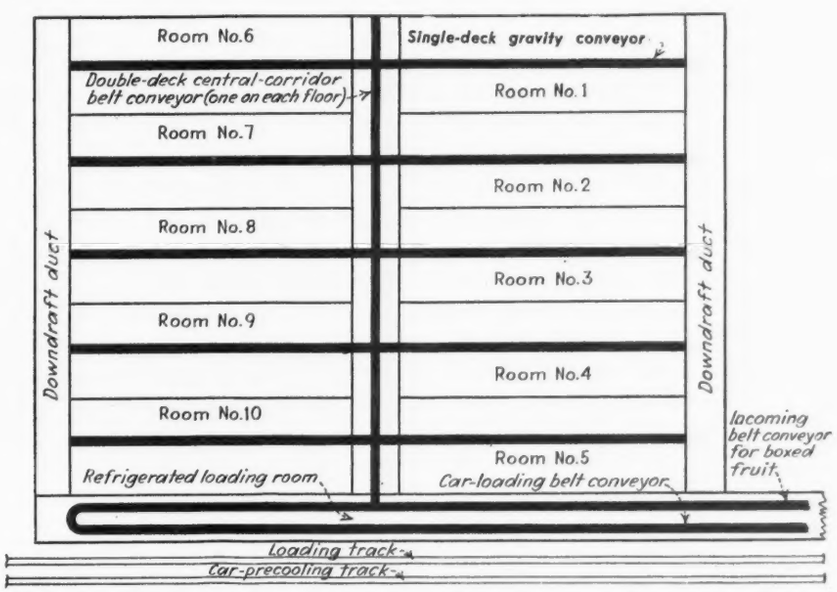
[1] Work on the effect of ethylene gas on fruit in storage was done by Henry Hartman, Oregon State College and research division of California Fruit Growers' Exchange.




**Cross-sectional elevation of the precooling plant, showing path of air circulation. The air passes through brine-film cooling units, down ducts at the ends of the building, into precooling and storage rooms, through floor ducts, into a central shaft, or corridor, and back to the brine loft.**



**Central corridor of the plant which acts both as a corridor and as a return air duct. Grilled floor openings permit passage of air. Branch conveyors carry fruit from this corridor conveyor into each storage room. Since this photo was taken, double-deck conveyors have been installed in the corridors.**




**Plan view of precooling plant, showing the ten storage rooms and the conveying system for handling the fruit. Note the down-draft air ducts extending across the entire width at either end of the building**

a day, together with storage space for 5,000 tons of ice.

Air circulation is provided by four blowers, one for each quarter section of the building, mounted at the center of the top floor. Each blower has a capacity of 61,000 cu.ft. of air per minute at a 1-in. pressure. These units draw air from a central riser in the building and force it into an equalizing room to insure mixing of the air from all parts of the plant. Then the air is equally distributed to the wet-film brine units, passing toward the ends of the brine loft where down-draft air ducts direct it to the lower four floors. Actually, the down-draft air ducts are an extension of the two end walls, the ducts being 3 ft. wide and extending the entire width of the building.

AT ONE END of each precooling room a movable vane extends into the down-draft duct deflecting the required amount of air (conditioned to 30 deg. F. and 94 per cent relative humidity) into the room. Entering the room next to the ceiling, the air passes downward over the boxed fruit and leaves through openings in the floor. Arranged in rows between the floor cleats, these openings are adjustable. Adjustability is effected by superimposing two sheets of metal, each of which contains circular openings. By sliding one sheet of metal over the other, any one of four different-size openings can be obtained.

From the floor discharge openings, the air flows into a duct made by using a suspended ceiling on the room below. It then discharges into the central riser shaft. Actually, this shaft is the central corridor of the building, converted into a huge return air duct by the use of grills at each floor level. It returns the air to the intake side of the blowers on the top floor.

Aside from its efficiency from a cooling standpoint, this installation permits the volume of conditioned air supplied to each of the 40 storage rooms to be adjusted easily, so that the fruit in one room may be precooled rapidly for immediate shipment while that in another room is held at storage conditions. Another advantage of the system is that ammonia fumes cannot possibly come in contact with the air being circulated in the plant.

As a result of having a large number of isolated rooms, it is possible to fill a room quickly and begin precooling. Then the fruit in storage is not subjected to the inevitable temperature fluctuations that occur in larger storage areas when uncooled fruit is placed in with that which has been partially cooled. Furthermore, the relatively small rooms prevent lateral transfer of heat between different lots of fruit, and they reduce handling to a minimum.

In addition to having a new and efficient precooling system, the Placerville plant is equipped for rapid and convenient handling of the fruit. Both the packing and storage facilities are designed to expedite the movement of the fruit into controlled atmosphere. Handling is done with a comprehensive system of belt and gravity conveyors. After being filled in the packing house, the boxes are placed on a belt conveyor feeding four automatic nailing machines. These machines feed boxes to the main belt conveyor through an automatic timer set to keep the belt loaded to capacity. This conveyor carries the fruit to a central conveyor system in the precooling plant, where it may be routed to any of the 40 precooling and storage rooms.

A 10-ft. section between the southern wall of the plant and the sides of the precooling rooms houses the central conveyor system. In this section are mounted all of the conveyors which feed the various floor levels.

**Packing fruit in one of the precooling and storage rooms. Note the floor cleats and the spacing between boxes to permit circulation of the air downward toward the floor outlets. Between the cleats are adjustable openings through which the air leaves the room. The air inlet is at the far end at the ceiling**

And on the lower floor is a car-loading conveyor that extends the entire length of the building and into an extension from which additional cars may be loaded.

Connecting with the central-system conveyors at each floor level are main conveyors extending the entire length of the central corridor, passing before entrances to the ten rooms on each floor. Branch conveyors lead from the corridor conveyors into each room, completing a system which minimizes handling. The corridor conveyors are double-deck, permitting handling in both directions simultaneously.

Contributing to efficiency in handling materials into and out of the plant is a pre-set control system for the belt conveyors. Through selector switches on a main switchboard, it is possible to set up a chain of conveyors leading to or from any point.

When the fruit has been precooled the boxes are placed on the room conveyors. Moving by gravity the fruit passes to the main belt conveyor in the corridor and thence to the car-loading belt. At various points in the outer wall along which the loading conveyor runs are conveyor apertures. Through these the precooled fruit passes into precooled refrigerator cars. The space in which the loading belt operates is kept at a reduced temperature, and during the loading period, the conveyor from the building to the car is covered by a canvas tunnel, so that the fruit is never exposed to outside air temperatures.

The refrigerator cars are brought into a parallel siding 24 hours ahead of loading time and precooled by icing to two-thirds capacity with ice and salt. After loading, the ice bunkers are filled to capacity.

It has been found that the temperature within the car during shipment is maintained at a lower figure by loading the car to a maximum capacity. So the former standard loading of 28,000 lb. has been increased to 37,200 lb. Cars loaded according to the foregoing procedure require no attention en route.

Incorporating entirely new design, the new precooling and storage plant has many advantages. The new wet-cloth system of heat transfer and the special air recirculating system provide an economical method of air conditioning where fairly low temperatures and high humidity are desired. This is particularly true for plants where a large volume of conditioned air is necessary.

# Routemen Go to School

***Peoria dairy develops training course that turns drivers into salesmen and gives improved distribution***

**By H. L. SPOONER**
*Peoria, Ill.*

HOLDING EXISTING BUSINESS and adding new customers, is the toughest job that any sales manager meets. And when the business is the house-to-house retail sale of milk, bakery products or any other food, the ordinary problems of competition are complicated by the constantly shifting make-up of the prospective customers, which makes it necessary to sell new customers all the time just to maintain the routes at par. To increase the customer list to any extent requires routemen of unusual ability.

One solution to the problem has been worked out by J. R. Hudson, sales manager of Baker-Hubbell Dairy, Inc., Peoria, Ill. He has established a plan which really amounts to a college course for the training of sales managers. When he came to his position in 1935, he found a personnel of routemen that was just average. They were excellent deliverymen and fairly good collectors and order takers. But they possessed little real merchandising ability.

To correct this situation a plan was put into use which has some features that are a real innovation in merchandising. It provides for the promotion of a proficient routeman to the position of supervisor. Supervisors have charge of three routes. They are responsible for sales, service and collections. They hire and discharge their own routemen. They must also train these routemen. They act as relief men when their routemen are off duty. They are paid a regular salary plus a commission.

As the supervisor's commission depends upon what his routemen do, he naturally employs only those who intend to remain permanently and look forward to being promoted to supervisors' jobs themselves. Supervisors also have something to look forward to—they may become sales managers of other plants.

The novel part of the plan, however, is the school. This is held at the plant, four evenings each week. Courses are given in the use of correct English, in public speaking, in the technique of the dairy industry, and in salesmanship. A class in each subject is held once each week.

Classes in public speaking and correct English are in charge of a teacher from the public school system. For a textbook, use is made of a series of booklets published by Better Speech Institute of America. Every person enrolled is required to give frequent talks on assigned subjects, which cover a wide range. As a result, the routemen and supervisors not only broaden their knowledge through preparing the talks, but also develop ease of manner, ability to think on their feet, and facility in the use of clear and correct English. This instruction qualifies for intelligent solicitation of customer prospects. It also qualifies supervisors to train routemen and, later, when they become sales managers, to lead and train a sales group.

The classes in dairy plant technic and salesmanship are conducted by Mr. Hudson. The technical course aims to give knowledge of milk and milk processing, so that customers' questions can be answered intelligently. The course includes the chemistry and bacteriology of milk, and follows the milk through all processes from the cow to the finished product. The composition and properties of every product and the reasons for every process are covered.

Subject matter of the salesmanship course includes proper customer approach, marshalled arguments, and proper follow-up methods.

Every class in the whole training course is taught from a prepared outline and follows a definite plan of presentation. Every lecture is followed by a round-table discussion, which brings out the experiences of individual routemen and supervisors on the points discussed.

Classes are arranged for the evenings, as the Baker-Hubbell dairy makes all deliveries in the daytime. It is not compulsory for routemen and supervisors to enroll in the classes in English and public speaking. At the present time, however, all of the supervisors and 60 per cent of the routemen are enrolled. The course is so popular that several of the office and plant employees are also enrolled.

It took nearly a year to get the training course completely set up. It is now reported to be giving excellent results. In speaking of it, Mr. Hudson said, "We let the men get the idea that they are simply working their way through college, and the only college in the world where they can get this kind of training. Under our plan, we attract a higher class of men as routemen, because our men have something to which to look forward. They stay longer with us because we have something to give them besides a weekly pay check. We have already placed several of our supervisors in good jobs as sales managers and are happy to let them go to a better job when one becomes available.

"THE MORALE of our men has greatly improved since putting our plan into practice. They are proud of their jobs as they no longer consider themselves as mere milk peddlers, but as real salesmen. This change in attitude toward their work has made them much better salesmen and every one of them has increased the business of his route. It has not only been instrumental in securing this new business, but it has also made it much easier to retain our old customers against the constant competition of other dairies. In addition, we have found that our advertising is much more effective when backed up by intelligent solicitation, something which our college training course for sales managers does."

# What is a SUPERMARKET?

## *Here's the Answer*

By IVAN C. MILLER
*Distribution Editor, Food Industries*

THOSE WHO ARE GRAYING AT THE TEMPLES can recall the corner grocery as a bright spot in the memories of their boyhood. Vivid to them are the ceiling-high shelves, the bins for staples, the candy case and the open cracker barrel. No small part of this store was the open display of plug tobacco, "Horse Shoe," "Star," "Piper Heidseick," and a choice array of 5-cent cigars. The corner grocery store was a man's store as much as a woman's. That was before the telephone and the automobile were common. Father brought home the bacon literally and he was a good provider. In many families he was the only buyer of food. Father's business week ended on Saturday night at the corner grocery store. Then he bought food as he would buy large blocks of stock. How the grocer welcomed father!

Then the system was revolutionized. Mother with her budget superseded father. The chains helped that. Mother became the family purchasing agent. Statisticians tell us she decided on 80 per cent of the family needs. She bought almost all the food. Now come the super-markets and a counter-revolution. Visit a super-market during the hours when men are home from work. Visit one at night, preferably Friday or Saturday night. It will be a revelation. Mother and father may come together, father may come alone, but father is there. Father is again buying food. He is again buying food in blocks as he once did stocks. In super-markets on week-ends or at night, men equal the women in numbers and far exceed them in buying. In the super-markets father is an interesting study. He guides the perambulator without embarrassment; in and out among the displays he wanders, examining packaged merchandise, shaking the contents, reading the labels, buying abundantly. Mother is a willing accomplice. If father over-runs the budget, he can't complain about the cost to mother. When mother bought groceries as was her custom, from her budget list, it was a cold business transaction. When she and father visit the super-market together, it is less a business trip; more a social occasion. In the morning, especially in the fore-part of the week, the super-market seems deserted. The few shoppers from the nearby neighborhood are lost in the supermarket's vastness. Individual sales are small. The traffic builds up hour by hour, until the peak is reached at night. Individual sales build up accordingly. In the morning each shopper goes about the business of buying food as an individual. At night, when the market is crowded, behavior is less that of the individual than that of the mass. The business of buying food becomes a social event. When the chore of food buying becomes family diversion, spending is freer. Spending reaches the abandon of the circus crowd. Psychologists call this abandon "mass hysteria."

The super-market exerts a powerful influence on the community it serves—an influence rooted deep in the community's social structure. It lifts food buying from routine duty to the level of social occasion. This is the fundamental difference between the super-market and all other food stores. This difference distinguishes the real super-market from the many so-called super-markets that are but overgrown "Piggly Wigglies." In consequence of the whole super-market movement there will be a vastly altered method of food distribution affecting everyone from manufacturer to consumer. In consequence of the true super-market there will be altered social customs as well as economic changes.

The accomplishments of the super-market and to a lesser extent the whole super-market movement, are not accidental. They are the result of improved merchandising, the culmination of retail food sales technique. In some super-markets a motley array of merchandise other than food and groceries is offered for sale. Many small stores are gathered under one roof to make a huge market. Each store or department is an individual enterprise which pays a concessionary fee to the building owner or market operator. The early super-markets were mostly of this type.

**This is not a striker's demonstration, but a crowd, mostly men, waiting to enter an already well filled market.**

When the width of aisle permits, perambulators are used. They make shopping easy and convenient.

More recent arrivals are operated entirely by the owners who have found it most profitable to confine super-market merchandise to food, groceries and closely allied lines.

Whatever else it may be, *the super-market is a food store.* Without food there could be no super-market.

Many of the early super-markets took their names from the menagerie or the side show. They called themselves "Giants," "Giant Tigers," "Big Bears," "Whales." They carried the allegories into their advertising, cartooning tigers ripping prices to shreds, bears clawing prices to bits, giants clubbing prices into submission, whales swallowing prices whole. More recent super-markets call themselves such names as "Food Fair," "Food Land," and "United Food Company." These later arrivals place less emphasis on price-smashing than quality and variety of foods. Several are using institutional copy in newspaper advertising and institutional themes on the radio. In appearance modern super-market advertising looks and sounds little different from chain store advertising.

The menagerie names came with the concessionary type of super-market. These were overgrown country stores transplanted into town. The super-markets of recent years are departmentized food stores with few or no concessions. When the modern super-market does lease departments on a concession basis, the departments are usually limited to perishable and prepared foods, tobacco and liquor in those states, where liquor can legally be sold in a grocery.

The first super-markets measured up to their boasts. They were price-wreckers. Much of the merchandise they sold was distress merchandise bought from bankrupt packers and wholesalers. Especially was this true of the food products they sold. At that time no small amount of food "substandard, but fit for human consumption," found its way to the consumer. Rarely is this sub-standard merchandise found in a super-market today, not at all in the most modern markets.

Most of the early super-markets took quarters in abandoned factories, warehouses or garages. In these barny structures, merchandise was piled on the floor or stacked on pine-board tables. Price was then considered the outstanding inducement. Later, premiums, prizes and entertainment were employed to bring out the crowd. Today in the most progressive super-markets, the market itself is sufficient inducement to bring shoppers from distances as far as 40 miles.

The prefix "super" means "more than," and conveys the idea of largeness. Super-markets are large establishments, large in floor area, large in the sale of merchandise. The large food store, however, is not the invention of the super-market. St. Louis, Providence, Dayton, and many other

Improved equipment and fixtures are characteristic of the new super-markets. The floor displays in this market are only used to round the ends of table displays.

One of several parking lots maintained for the convenience of customers of a Rhode Island super-market.

cities, have for years successfully operated public markets with floor areas surpassed by few, if any, super-markets of today. Yet floor area is important to the super-market. Floor area bears a definite relation to total sales and annual profits. The operating cost per dollar of sales, affords a much longer margin of profit for a large self-service market than a smaller unit, regardless of the fact that small self-service stores with floor area of less than 5,000 sq.ft. may average in sales as high as $1.50 per sq.ft. per week, while in markets with more than 20,000 sq.ft. of area sales will average nearer $1 per sq.ft. per week. The percentage of yearly net profit is closely proportional to the ratio of floor areas. Other overhead decreases with increased display space.

The larger the market, the larger the crowd it attracts, the larger the gross profit, the larger the percentage of net profit, providing the merchandising is geared to the volume requirements. This merchandising includes location, parking accommodations, variety and quality of merchandise, equipment, arrangement of displays, conveniences of the system and advertising.

### *Location and Parking Accommodations*

The super-market is not a neighborhood store like the independent and the chain store. It can only thrive when it draws on a large population, as well as from a wide area. Super-market success depends on transportation facilities. It could not have existed in many localities before the general use of the automobile. No matter how great the other attractions,

**Convenience is the keynote of the super-market. It extends even to the service performed by page boys who carry the sacks of groceries to customers' cars.**

the super-market's sales volume is limited by its parking space, whenever parking accommodations are inadequate. Ample parking space is a vital requirement of the super-market. Location on or near traffic arteries is also essential. The traffic which arrives by surface car and bus is important to some super-markets, but generally such traffic is secondary to automobile traffic. The alert super-market operator does not choose a location by guess. There are measurements on which to forecast the success of a location. The location's potential sales volume is gaged by the number of car-owning families within its trading area.

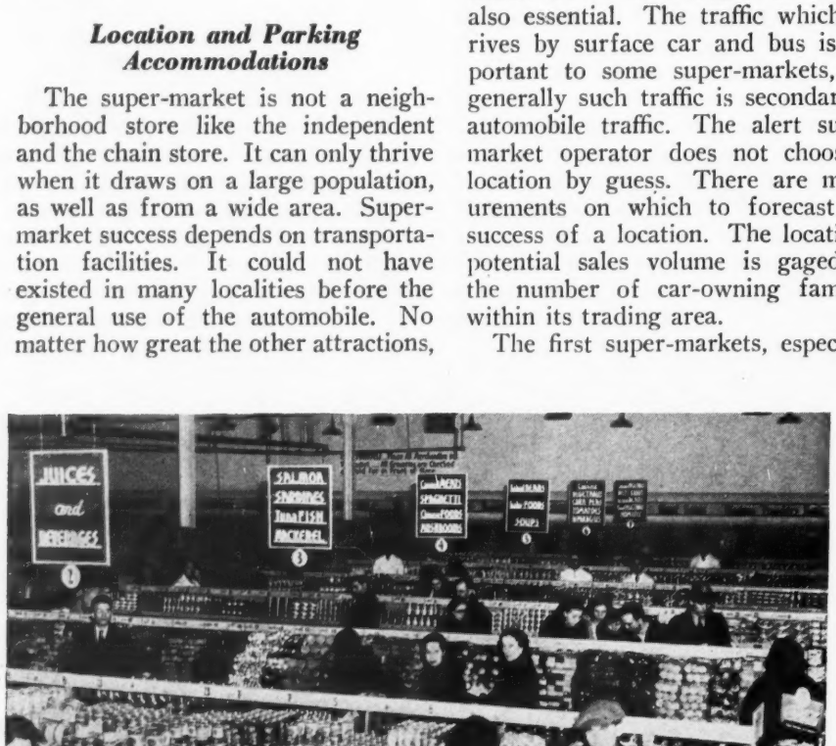
The first super-markets, especially in the East, were located in or near thickly populated industrial areas. The more recent super-markets are located convenient to the best residential districts of the community. Families in the lower income groups will migrate to neighborhoods better than their own to shop, but the middle class and upper crust hesitate to shop in poor neighborhoods. Depression super-markets catered to the financially pressed industrial workers. The modern super-market draws its customers from all classes including the wealthy. Liveried chauffers frequently push perambulators while wealthy shoppers fill them. Packards, Cadillacs and Lincolns are not strangers to the super-market parking lots.

### *Equipment and Arrangement of Display*

Piggly Wiggly created a sensation years ago when it introduced the self-service grocery, but Piggly Wiggly did not exhaust the possibilities of this form of merchandising. Super-markets have improved self-service methods far beyond where Piggly Wiggly left off. They have introduced mass display, great variety of products and additional shopping conveniences. Mass display is common to all super-markets but the method of gaining this effect varies greatly. In some markets merchandise is still stacked in piles on the floor. However, this method of display is used less frequently than formerly. Generally merchandise is displayed on long tables or racks. Originally these were built of pine boards by local carpenters. Equipment companies now offer an extensive line of attractive display tables and racks. The table most frequently met in super-markets displays groceries above the waist level and below the eye level. Shoppers seldom choose merchandise for which they have to reach or stoop. The space below counter is used for replacement stock. In many super-markets warehouse and selling floor are one.

Although many super-markets now display from 6,000 to 10,000 non-perishable items, the future will see even greater variety. A few super-market merchandisers are attempting to determine the ratio of sales of an item to the number of vertical rows on display or to the width of the display. They have learned that the sales of an item increase arithmetically with the number of vertical rows to the point of diminishing returns.

(*Turn to page* 421)




**Displays are above the waist level and below the eye level, replenishment stock is in the space below.**

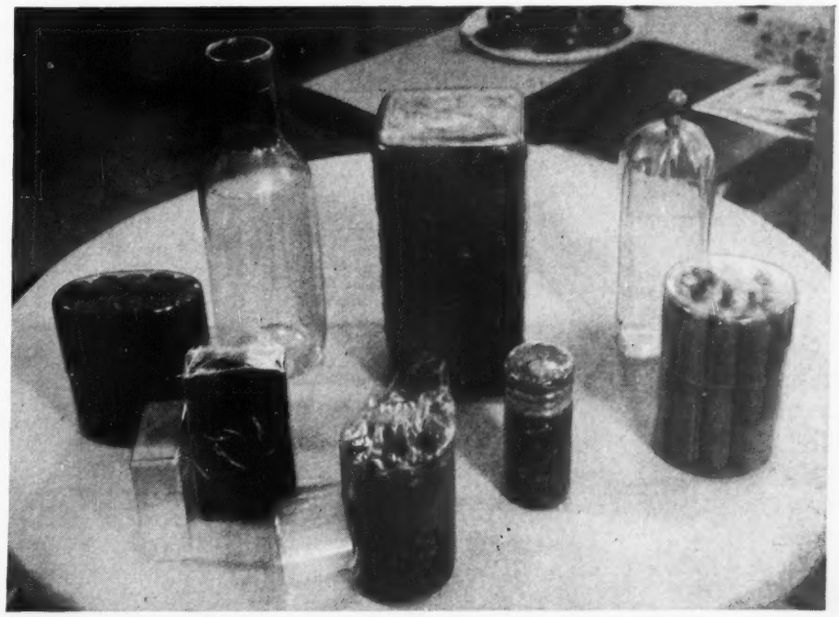
# Merchandising
# HINTS AND HURDLES

***FTC vs. F&DA.*** The recent Brookings Institute report recommends that the Federal Trade Commission be the regulating body in control of food and drug advertising, rather than Food & Drug Administration. Thus, the report states, will food and drug regulation be protected from attempts to make of it a political football. The report suggests, however, that to Food & Drug Administration be delegated the responsibility of prosecuting cases which involve misbranding and advertising actions in which public health is paramount. Senator Lea's bill likewise favors FCT by giving it authority over *all* unfair or deceptive acts in commerce instead of only those in which unfair competition can be proved. Consumers, however, do not trust the effectiveness of FCT's "stop and desist" orders. Many manufacturers also want assurance that competitors' fraudulent advertising and branding will be effectively ended. The viewpoint of each one concerned varies according to which side of the bread is buttered. Result: further delay.

***Effective Propaganda.*** Brewers, with the memory of prohibition still fresh in mind, are entrenching themselves in public favor by a series of brochures prepared by United Brewers' Industrial Foundation. One of these, "Beer in the American Home," by Eloise Davidson, traces the history of beer through the ages and stresses its general usage and importance in American history, especially in Colonial days. The booklet places particular emphasis on the food value of beer and includes many recipes in which beer is an essential ingredient. The foundation intends to carry institutional messages to the public via all media to leave no segment of the American public unreached. The power of propaganda is well recognized. Institutional advertising, often a less bombastic, more subtle form of propaganda, has been a profitable ally to those who have used it intelligently. It has created sales as well as good will. Other food manufacturers can profitably include institutional advertising in their advertising plans.

***Helpful Market Studies.*** The old-style newspaper surveys that were conducted to prove the "outstanding quality" of the newspaper's circulation are being replaced by market studies designed to untangle mechandising snarls for the benefit of retailer, jobber and manufacturer alike. The Cleveland *Press* has recently completed the fourth annual Cleveland study. The study was conducted by the Parent-Teachers' Association of each Cleveland metropolitan school area. A nominal sum was paid to the association for each questionnaire filled out by one of its members. Tabulations and compilations were made by I.B.M. The four-year study indicates the trend of consumer preference for brands and retail outlets. The trends are further indicated by income groups. This type of study can be helpful to the manufacturer with distribution in the surveyed territory, and also to those planning to enter the territory. Among newspapers which completed studies in 1936 are Chicago *Tribune,* Columbus *Citizen* and Cincinnati *Post.*

***Private Brands Favored.*** Under the name "National Names in Chain Store Advertising," Bureau of Advertising, A.N.P.A. reports the result of a study of chain store advertising to determine the relative frequency of mention of national brands and distributor brands. Chain-store advertising in cities representing 8.1 per cent of the country's total newspaper circulation was compared for the first two months of 1935 and 1937. The study covers a comparable period before and after the passage of the Robinson-Patman law, and indicates the law's effect on chain-store advertising. Seventeen classifications of groceries were studied. Although the chains mentioned more national brands in three of the classifications, the trend is toward placing emphasis on distributor brands in preference to national brands. Not only have the chains shifted advertising preference to distributor brands, but so far as these seventeen classifications are concerned, chains advertised them less during 1937 than 1935, when advertising generally was on the increase. Mention of items in the seventeen classifications appeared approximately 27 per cent less frequently during the 1937 period than during the 1935 period.



**Displayed at the Leipzig Trade Fair was a group of new transparent containers of rigid construction. Called "Runcolit," the transparent material is produced from wood pulp by Wilhelm Runge & Co., Cologne, Germany. The packages for coffee and tea are interesting in that attached within and near the top of the rigid container is a flexible transparent material that remains tight when twisted. This inner closure is for preserving the freshness of tea or coffee on the pantry shelf after the outer container has been opened. Coffee and tea are distributed in this container by Tingleman Co., through its 4,000 stores. The wholesale price per container is about six pfennig, equivalent to 1.2 cents, current exchange**

# New

### *Package for Corner Labels*

THE UNIQUE CORNER LABELS on Gordon & Dillworth Co.'s marmalade make an interesting combination package. An inexpensive cardboard wrapping holds two jars of marmalade firmly together, yet permits the corner labels of each to be completely visible. Retailers report increased sales from the combination package.

### *Dairy and Syrup Makers Cocoa*

A SOLUBLE COCOA, which remains in solution without the aid of colloidal thickeners, has recently been offered to syrup manufacturers and to the dairy industry. A product of Heyman Process Co., New York, the cocoa imparts color and flavor to milk drinks in which it is used, but remains in complete suspension, deposits no sediment and requires no heat application in preparation of chocolate milk drinks.

### *Three New Fruit Juices*

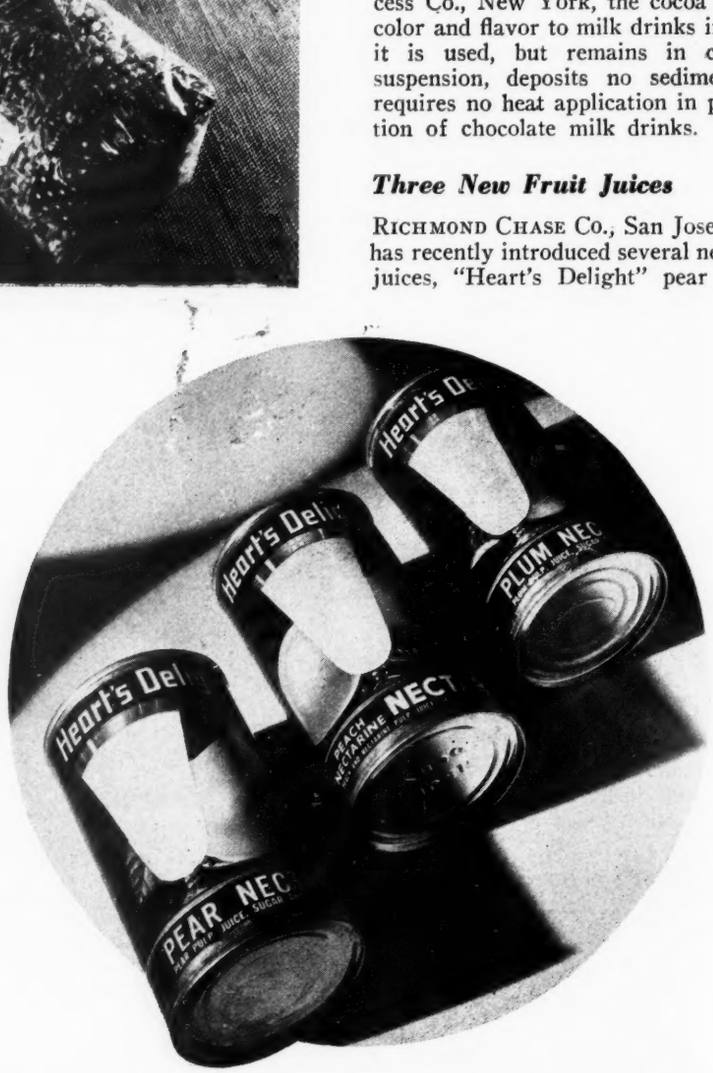
RICHMOND CHASE CO., San Jose, Calif., has recently introduced several new fruit juices, "Heart's Delight" pear nectar,

### *Double-Walled Transparent Pack*

DWARFIES CORPORATION, Council Bluffs, Iowa, has re-packaged "Dwarfies Jumbo Wheat" and "Dwarfies Jumbo Rice" in a double-walled transparent cellulose bag. Each bag is separately heat-sealed and both bags are heat-sealed together at seams and crimp-sealed at the openings. The two-color label is printed on the inner bag. In stores where they are sold, sales are reported measurably increased as the result of the new packages.

### *Packed for Institutional Trade*

CONVENIENCE TO THE TRADE is the important feature of the "White Rose" maraschino cherry container. The product, marketed by International Fruit Products Co., Cincinnati, is packed with or without stems in square squat half gallon and gallon jars with openings large enough to make removal of the contents convenient.



# PACKAGES AND PRODUCTS

peach nectarine nectar and plum nectar. These juices are packed in No. 1 tall cans, with paper labels. An illustration of the fruit for each juice is printed in color on a background of deep blue.

### *Say It Fast*

HORS D'OEUVRES CHEESE "TEEZ," product of Kraft-Phoenix Cheese Co., Chicago, has recently been added to the Kraft-Phoenix family. It is a "blend of cream cheese, Roquefort cheese, spices and selected meats," packed in re-use drinking glass containers.

### *Checker-Board Family Addition*

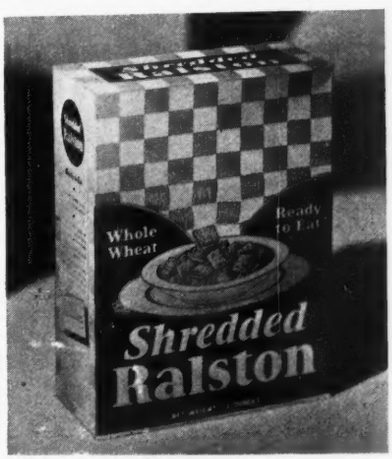
"SHREDDED RALSTON," after a year of market testing, was introduced by Ralston Purina Company, St. Louis, in its Western market. Recently the product has obtained approximately 90 per cent distribution in the East. Distribution was obtained by sampling with the aid of local advertising. Shredded Ralston, processed from whole wheat and carrying a malt flavor, introduces several new dry cereal features. The firm half-inch squares are a convenient eating size, require no crumbling and remain crisp in milk or cream. The package carries the family red-and-white checker-board design. The red squares at the bottom of the checker-board label are pictured changing to Shredded Ralston squares and falling into a cereal bowl.

### *Window for Coconut*

"DROMEDARY" COCONUT, product of the Hills Bros. Co., New York, is now packaged in a window container. The re-packaged product is being introduced to the trade through a combination offer, with a related Hills Bros. Co. product, Dromedary Devils Food Mix. Both packages are transparent cellulose wrapped.

### *Radical Package Change*

THE METAL LOG CABIN SHAPED CONTAINER of "Log Cabin Syrup" has been for many years a familiar item in most groceries. The Log Cabin Products Co., Hoboken, N. J., is now selling its product in a tall tapered, hexagonal bottle. The bottle is sealed with a compression cap which is removed by prying on a wire opener attached under the cap. The cap can be snapped back on to reseal the bottle. The new label carries a facsimile of the original metal log cabin container.



### *And Now Prepared Prune Whip*

CALIFORNIA PRUNE & APRICOT GROWERS ASSOCIATION, San Jose, Calif., is marketing "Sun-Sweet Whip Prune," strained pulp of prunes to be used in making prune whip. The product packed in a re-use glass drinking tumbler, to serve six, is suggested for infant feeding and special diets.

Originality in body lines; body skirting; floodlighted front-panel lettering, and recessed, glass-covered panels with moving animal figures distinguish this Mack, Jr., truck. It is used for New York City hotel and restaurant deliveries.

# Cashing In on TRUCK STYLING

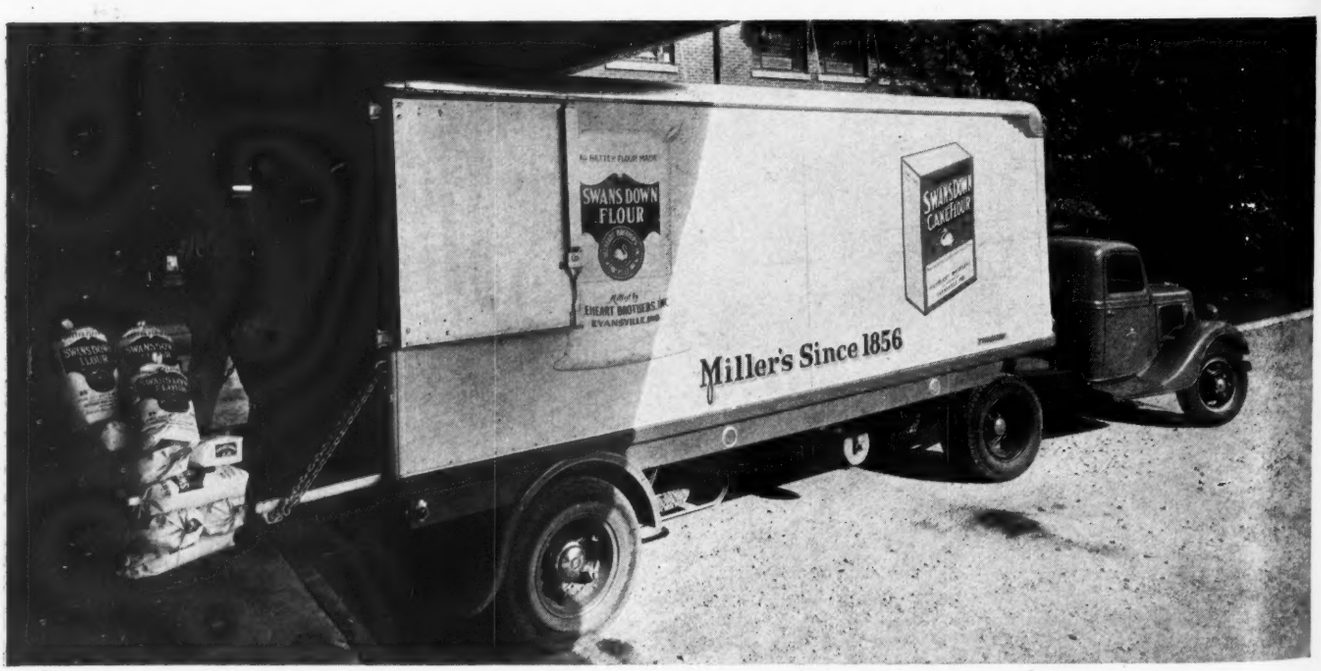
***Body designs which enhance the advertising value of food carriers***

FOOD-FLEET OPERATORS as a class have long been conscious of the extensive advertising value of their motor-truck bodies. And many are capitalizing on this value to the fullest extent by careful attention to body design.

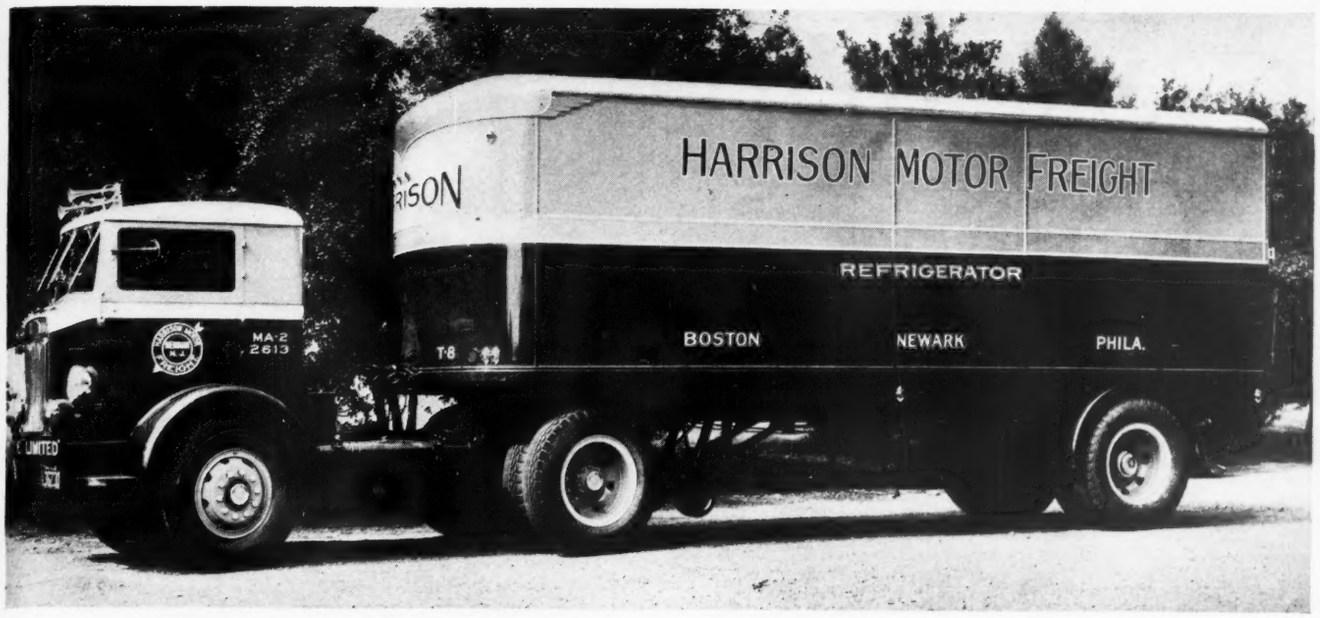
Because cleanliness and purity usually go hand in hand, the use of light-colored truck-body paints has become the rule rather than the exception with companies handling food products. But to cash in fully on the advertising value of truck bodies, something more than a light-colored paint must be used. It is taken for granted that the bodies must be kept clean by frequent washings. To attract attention on the road, the bodies should have originality of lines and be well proportioned. Then the body, cab and chassis should be balanced in relation to each other to form a harmonious whole pleasing to the eye.

The elimination of the box-like body with square corners and a square roof line has done more than anything else to improve body design. Substitution of rounded corners and a rounded roof line has been of the greatest importance in bettering appearance.

Modified streamlining borrowed




Painted as white as the Swans Down flour which it delivers, this Fruehauf semitrailer and Ford tractor combine both good looks and utiltiy. The trailer carries 21,000 lb. of sack flour or 300 bu. of wheat. The color combination is cream and red. Note the rounded roof edges. The unit is owned by Igleheart Bros., Evansville, Ind., subsidiary of General Foods Corporation.




**This well proportioned tractor-trailer combination is one of four recently installed by Harrison Motor Freight of Newark, N. J., to rush fresh and drozen fish from Boston to Philadelphia. The trailer is insulated with Dry-Zero and refrigerated to maintain a temperature of 5 deg. F. for frozen fish or 40 deg. F. for fresh fish. The tractor is an A.C.F. The standard Fruehauf trailer, which carries a load of 25,000 lb., is 25 ft. long. Note how the apparent length and height are minimized by the darker panel.**

**With its roof V-necked in front, this Trailmobile trailer makes a good looking combination with the Dodge tractor. They are used to haul beer by Burkhardt Brewing Co., Akron, Ohio. Note the contrasting-color trailer panels and the effective lettering layout.**

from the airplane industry has also helped to improve body appearance. Examples of such efforts in truck-body design include the slanting rear end of the body and side, and rear-end skirting below the floor and the line of the runningboards. This, with the use of rear-wheel housings inside the body itself, has helped to reduce the apparent height of the body.

In all such attempts to improve body appearance, it should always be borne in mind that the main purpose of a truck body is to carry goods. So changes in design should not be made at the sacrifice of carrying capacity. Such changes make the motor truck less efficient as a transportation medium. The most successful body designers combine both utility and beauty in the finished body.

With outside body widths limited by law, height and length remain at the discretion of the designer. Greater length permits the height to be reduced to a pleasing proportion while still providing large cubical capacity. Excessive overhang beyond the centerline of the rear axle has been remedied by the use of chassis of longer and proper wheelbases to accommodate the weight of the load to be carried.

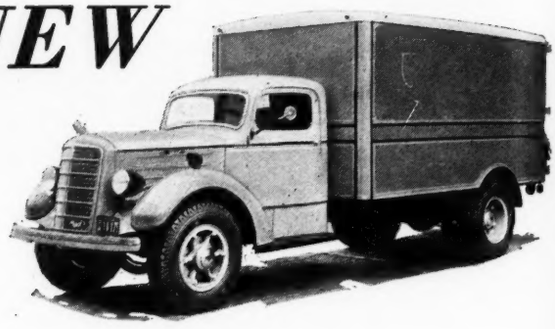
In bodies of large carrying capacity, such as those used on semi-trailers hauled by tractors, the appearance of greater length and height, so obnoxious to most road users, may be lessened by a horizontal belt panel. In many cases, the upper panel is light colored, and the lower is of a darker, contrasting and complementary color.

After the body has been designed to look well and to carry the necessary load, there remains one other requirement to be met. This is effective lettering layout. The lettering must tie in with the product, so the style of lettering usually follows that used on the company's packages and in printed advertising, letterheads and so forth. Trademarks are also used extensively. These may be either expensive hand-painted designs or decalcomanias.

To attract attention at night, lettering on the front body panel (above the top of the cab) may be illuminated by a small floodlight mounted on the cab. Another ingenious method of attracting attention both by day and by night is the illuminated inset glass panel, as shown in the illustration of the Puritan Beef Co. truck at the top of the preceding page.

# Trading OLD Trucks . . .

# for *NEW*



## *When to do it*

FROM A COST STANDPOINT, it is important that truck and commercial-car operators trade in their vehicles at the right time. The time to trade, of course, is when costs of maintaining and operating the old equipment exceed the expense of buying and operating new vehicles. But how can you determine when this time arrives? This is a problem which worries all truck and car owners. The answer, as found by executives in the food field, is discussed in this symposium.

### *Trade-In Based on Mileage*

Whether year-old equipment should be traded depends entirely on the number of miles a truck or commercial car has been operated, the exact condition of the vehicle and the condition of the used-vehicle market.

Ordinarily, the lowest-price light-duty trucks should be traded between 75,000 and 125,000 miles, providing they are driven upward of 20,000 to 25,000 miles per year. If lower mileage per year is recorded, the total number of miles of service may be decreased in favor of early replacement in order to take advantage of new improvements.

More expensive equipment traveling heavy mileage—between 50,000 and 100,000 miles each year—should be operated between one-quarter and one-half million miles.

In determining when a vehicle should be traded, we take into consideration the age, whether or not it is obsolete equipment, its operating cost and the miles of service it has rendered. Our car depreciation is based on years of operation.

A truck normally should be depreciated in direct proportion to its mileage.—H. H. COREY, *Vice-President, Geo. A. Hormel & Co., Austin, Minn.*

### *Runs Trucks 100,000 Miles*

We feel that it is normally cheaper to use a car from two to four years than it is to trade it in every year. We have some trucks whose ages run up to eight years.

Several years ago we started standardizing on Chevrolets, and our experience is not a recent one on other makes. Depending upon the make of truck and the type of service that it is used in, we feel that a mileage of approximately 100,000 miles is a good point at which to make a trade. We have some trucks in service in the city where the stops are quite frequent, and we find that the wear and tear on these trucks is much more per mile than on those trucks covering long distances.

We trade our trucks when the cost of repair amounts up quite rapidly. Normally, we get more than four years' service out of a truck before it is old enough to trade in. If in those four years, it has made upward of 100,000 miles on a country route and if the cost per mile after depreciation has been discontinued is more than the cost of a new truck over a similar route, including depreciation, we trade the truck in.

We depreciate our trucks on the basis of 25 per cent per year. While this probably is not as good a plan as the mileage system, it is much more simple for bookkeeping purposes.—ARMAND HECHT, *Hecht's Bakery, Bristol, Tenn.*

### *Upkeep Cue to Trade-In*

Whether a truck should be traded in after the first year depends upon the class of equipment a company operates. If it uses the cheaper type of truck and accumulates a good many miles in one year, it might be cheaper to trade it in than to attempt to repair it. We find that with a thorough preventive maintenance program, trucks of the medium to high-priced class are good for a number of years.

The age or mileage at which it would be best to trade in a truck from the standpoint of cost again depends upon the service the truck has been given by the owner. With proper preventive maintenance, the age or mileage can be extended considerably before it is necessary from a cost standpoint, to trade the vehicle. Speaking for ourselves, we are guided entirely by the performance and maintenance costs in reaching a conclusion of this kind.

The method for figuring depreciation depends upon the accounting methods of the individual company. We find that depreciating automotive equipment on a yearly basis works out better for us than on a mileage basis, although we keep accurate records and could very easily use whichever method suited our accounting best.—H. E. WENNAGEL, *Traffic Manager, Wm. Schluderberg, T. J. Kurdle Co., Baltimore, Md.*

# Why Do It This Way?

As an antidote for all the unrest and speculation about John L. Lewis, and what all his little playmates are likely to do, give a little thought to the problem of improved production efficiency. A good way to approach the problem is to pretend you are a visitor in your own plant. Assume a point of view of one who has never been in the place before. Then start through the works and ask yourself "Why?" about every step and every operation in the whole establishment.

"Why do we do it this way?" and "Why wouldn't it be better to do it some other way?" should be your stock questions. Also here are a few other questions to put to yourself whether you are a foreman, superintendent, manager or vice-president: "Who started doing this in this particular way? Did I do it, or is it something I inherited from some predecessor on the job? If the other fellow did it first, is it as good as I can do it?"

### *Nothing to Do But Ask Questions*

Not over six months ago a large food company hired one of the smartest men in the country at a rather sizeable salary. His instructions were to ask questions about everything that excited his curiosity. He was to become a professional "why" man. He was cautioned to be sure to get the answers to all his questions before he became so well acquainted with his new place of employment that he would unconsciously accept existing conditions.

The head of this company was fearful that the organization might be becoming complacent without knowing it. By continual questioning of the reason for every practice and operation the president is going to compel everybody to think of a better way if it is possible.

Anybody over 30 knows that this sort of a job is a tough assignment, for it calls for a degree of combined persistency and diplomacy. Absence of both might easily render the work ineffective. The stranger coming in may meet many a rebuff from crotchety old timers whose sole reason for continuing a given method is that they have always done it that way. You can almost hear one of them retort in a crabby voice, "Who told you that you know anything about this business?" For such reasons, the smoother way is to ask questions of yourself. If you are serious and intellectually honest, you can unearth a lot of questionable methods and ways of doing work that ought to be modified, improved or thrown overboard. Whether you can put such needed changes into effect depends on how much authority you have, but you can always suggest to your superior that you have a better way.

### *A New Stockholder's Questions*

Here are some questions that came to a new stockholder of a food company who went to see how the business was run one afternoon.

Why are freight cars allowed to half-block the roadway?

Why is all the rubbish allowed to remain in the yard?

Where is the manager?

Does Rotary Club keep going this late?

Where is the superintendent? Sick?

Does the assistant superintendent always sit in his office cleaning his finger nails?

What are those fellows supposed to do? They have been chatting for ten minutes.

Why is this place so disorderly?

Do they leave that tractor out in all kinds of weather?

Is there no place to put it?

Why is that motor running idle?

Why isn't that assistant superintendent out here looking after things instead of sitting on his tail?

Why are all these people passing to and fro?

Dosen't anybody ever work here?

### *Why Wet Floors?*

One of the mysteries of the behavior of men is their desire to play around with a stream of water from a hose when they are set at a task of cleaning up. And another mystery is the thinking of the management which lays out a plant in such a way that the place is always wet. The idea seems to be that to spill water on the floor is the surest way to get it into the drains—but is it? Most folks think it much too slow.

Of course, one must admit that at clean-up time in the factory the hose is the time-honored instrument of cleaning. Nevertheless, as has often been pointed out on this page, spraying cold water on dirty equipment is not effective cleaning. Yet the idea continues to prevail that much spraying of water is identical with cleanliness.

In plants where wet operations are carried out the amount of water that is splashed around is usually amazing and the whole organization is likewise afflicted with the water habit. Even locker and wash rooms get a daily flood from a big hose. And unhappy indeed is the worker who has to go there for a clean up or change of clothes if the janitor gets there first.

If this department were wholly without experience it might be advisable to say nothing—just do a lot of thinking and asking questions. But since our own experience has shown that most plants can be kept dry by a little care and planning the next question arises: Is it worth while to keep the floors dry? Our answer, based on many years of experience, is that it is decidedly worth while for several reasons, such as:

1. A clean wet floor never looks as clean as a clean dry floor.
2. A wet floor will get dirty quicker than a dry floor.
3. Employees health is better where floors are dry.
4. Boots are heavy and the help wearing them gets weary too easily. Why pay people to do work that does not need to be done?
5. Water often causes rust, rot or corrosion of equipment.
6. Wet floors are usually slippery and falls are more frequent.
7. What is most important is that we just don't like wet floors!

### *Damp Spots Mean Trouble*

During the muggy summer days, when the humidity is high, you have a splendid chance to find out something about the condition of the insulation on your refrigerated rooms.

If you see any damp *spots* on walls outside these refrigerated spaces, it means that there is a cold spot. And, if it is cold, it means that something is wrong with the insulation underneath.

Defective insulation means wasted dollars. The waste may be loss of power for driving the ammonia compressors, or it may also mean loss of quality of goods in storage through inability to maintain proper temperatures.

To say that the insulation ought to be all right simply because so many inches of cork were put there a few years ago is not the correct answer to the question. Every damp spot means something wrong. If the whole wall, floor or ceiling is damp it probably means that the insulation was not thick enough in the first place.

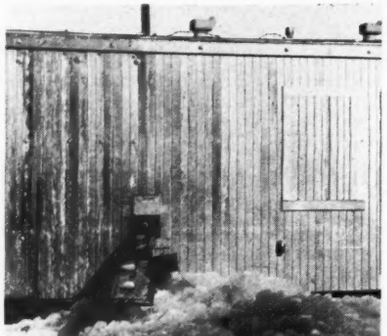
# *The* PLANT NOTEBOOK

## Mobile Ice Plant for Packers and Shippers of Food

Declared to be the first of its kind in the world, a self-contained mobile refrigeration plant all housed in a standard freight car, is now in service. The power for this plant is a 160 hp. full diesel engine of the eight-cylinder V-type. The icemaking equipment consists of a Pak-Ice briquette machine, ammonia compressor, evaporative condenser, liquid receiver, generator, pumps and fuel and water tanks.

Although this outfit has been in service for only a short time, it has been found to have many advantages, two of which are economical operation and instantaneous production. It attains full capacity production in twenty minutes. Radiation, friction and crushing losses, which may run as high as 25 per cent in a can ice plant, are eliminated. As to economy, the national average price for diesel fuel is only 6 cents per gallon, and oil consumption averages only 4.9 gal. per ton of ice produced.

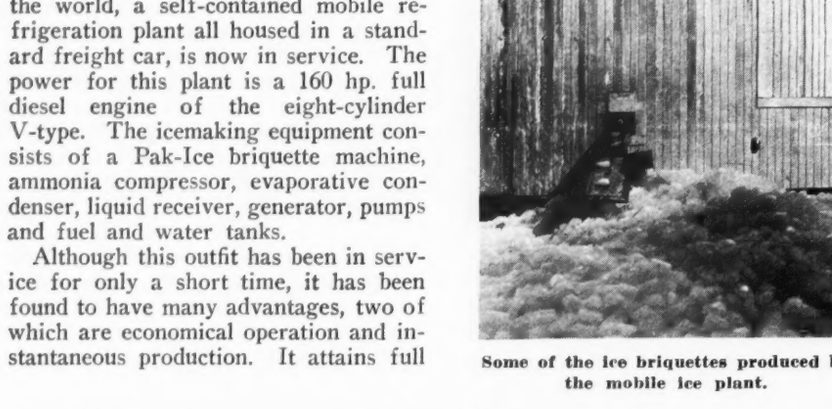
This track ice unit was designed especially for icing refrigerator cars. It is entirely independent of outside power and resources, with the exception of water, and this feature permits its operation when and where desired throughout the network of United States railroads. It has been pointed out that some agricultural communities require ice for only one or two months out of the year, making a permanent ice plant impractical. Formerly ice had to be brought in from distant points at prices as high as $8 per ton. Including power, labor, water and depreciation, the new mobile unit can produce ice in these communities at a small fraction of this figure.



Some of the ice briquettes produced by the mobile ice plant.

Briquettes can be turned out from this unit in any one of four sizes, ranging from 2 oz. to 1.6 lb. each. Automatically ejected from the press, they are spouted out of the car through small openings in the side walls. From there they may be spouted, conveyed or shoveled into storage bins or directly to the point of use.

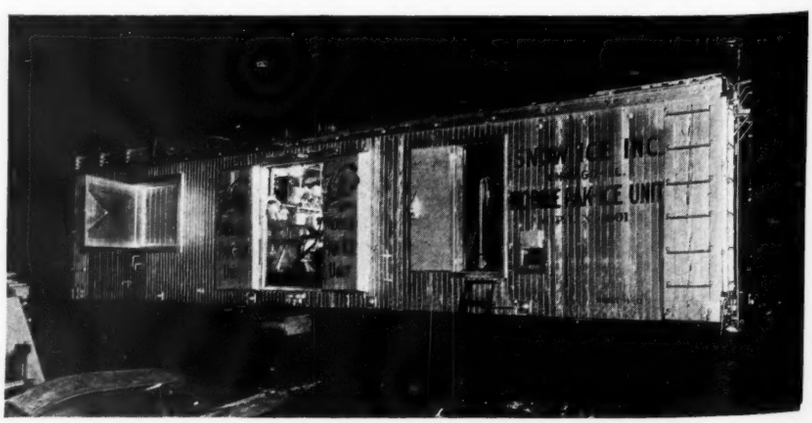
Both briquettes and ice in a snow or crystal form may be produced. The uncompressed snow is useful for layer icing of fruit and vegetables because of its fine, soft texture which does not cut or bruise the shipment. The briquettes are used for car icing or space cooling as their rounded shape is such that ample space is provided for free circulation of air.—*Information source,* CATERPILLAR TRACTOR CO., *Peoria, Ill.*



Caterpillar diesel engine and Vilter ice machine in mobile ice plant.

## Compounds for Treating Boiler Feed Water

For the moderate size power plant operating at ordinary pressure and with the boiler feed water being mostly condensate, internal treatment by compound is usually the most economical. However, unless the compound is selected with the greatest of caution, this method may prove to be the most expensive. The reason for this is that there are many compounds that apparently are sold by firms or individuals not entirely qualified for this work. Some of these compounds have been designated by water chemists as mere "colored water," which is worthless but for which the



Mobile ice plant for use by packers and shippers of fruits, vegetables and perishable foods.

buyer pays 10 to 20 cents per pound. Others are harmful or even dangerous. And this explains why manufacturers of scale removing equipment are still doing a flourishing business, notwithstanding that the means for the prevention of scale formation is available.

Three good rules to follow in compound selection are: (1) Buy only from firms or individuals that are known to be qualified; (2) Know the ingredients of the compound and these must be on the basis of the water analysis; (3) Do not introduce an unknown compound into the boiler.

Compounds that are known to give satisfactory results are made up mostly of soda ash, with lesser amounts of trisodium phosphate, sodium aluminate, starch, and tannin. The "Navy Standard Boiler Compound" is composed of 76 per cent soda ash, 10 per cent trisodium phosphate, 1 per cent starch, 2 per cent tannic acid and 11 per cent water. This compound should give satisfactory results in all but special cases.

Next in importance to selecting the right reagent is the amount of dosage to be used. The suppliers of the chemical usually state what dose to use, but this is to serve only as a starting point and must be modified on the basis of results obtained, as determined by test.

Of the several tests the most indicative is the hardness test which is determined by adding soap solution to a measured sample of boiler water and shaking it until a permanent lather appears. The hardness should be reduced to half a grain per gallon or as close to it as is possible. The correct dose is when the minimum hardness has been obtained with the least amount of chemical. Starting with say half a pound of chemical per 1,000 gal. of raw water, if the hardness is over a half grain per gallon, the chemical should be increased until the minimum hardness is obtained. But if the hardness test on the first trial is half a grain per gallon, the dosage should be reduced so long as the hardness remains at the minimum point.—N. T. Pef, Chicago, Ill.

## Trip Switch Avoids Jams

When conveying materials, there is always the possibility that an improperly placed article will cause a jam or a spill. Properly located trip switches in motor starter holding-in circuits are often used to avoid these accidents.

One application of this type of switch, in a large food plant, is shown in the drawing. Cans, dumped from cooking crates on an unscrambling table, are elevated by a booster conveyor to the can track feeding a casing machine. Before installing the switch, cans would often become misplaced on the conveyor, and, upon reaching the can track, ride up on one side.

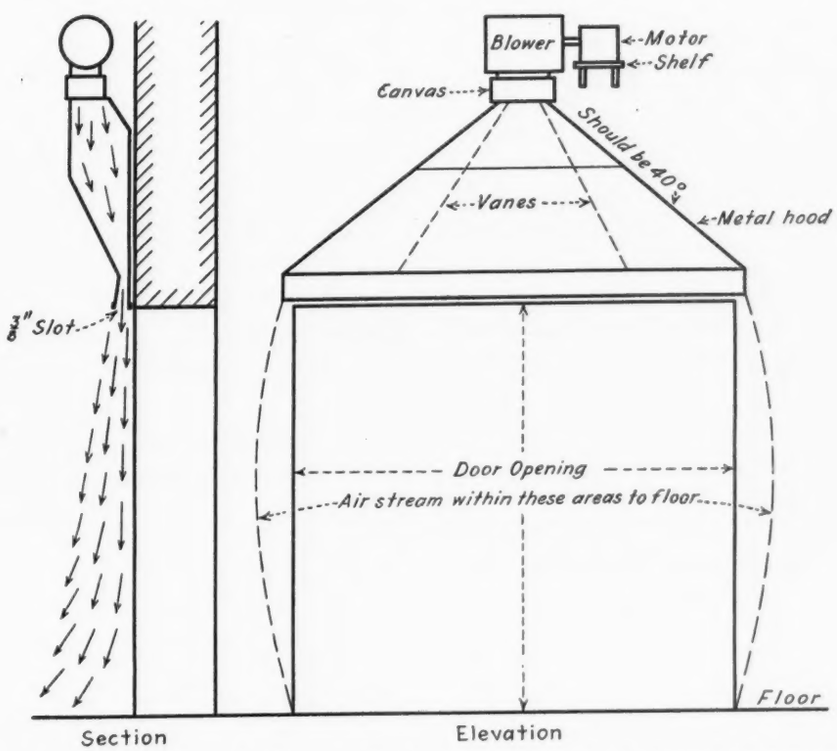
At the casing machine these cans would fall into the rack endwise rather than horizontally, and, unless the operator stopped the conveyor immediately, would jam the system causing many cans to fall on the floor and become dented. With the switch, however, a misplaced can will open the switch and stop the conveyor, which cannot be restarted until the can is in its proper place so that the trip lever can drop and close the circuit.—S. H. Coleman, *Roanoke, Va.*

## How to Keep Flies Out of the Plant

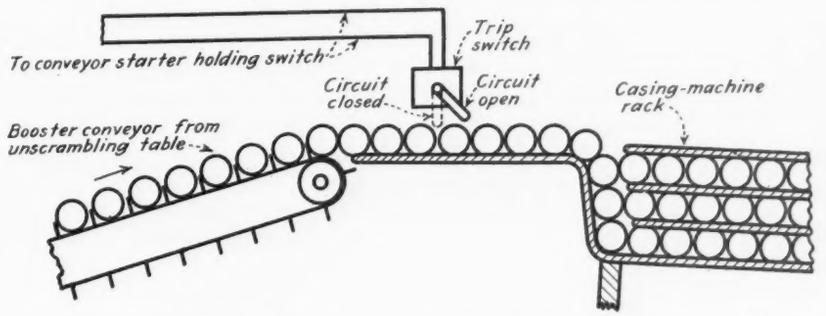
When doors at loading platforms and shipping docks must be kept open, it is a problem to prevent flies from entering the plant. One simple, but effective, solution is based on the fact that flies will not move against the wind. Therefore, by creating an outward draft at the open doorways, the flies are repelled.

In the accompanying sketch is shown a device for putting this method of fly chasing into effect. This sketch shows a motor and blower mounted on a shelf above a doorway. The blower delivers through a canvas sleeve to a hood. This hood is provided with vanes to distribute the air, and discharges through a restricted slot, not more than $\frac{3}{8}$ in. wide over the entire width of the doorway. The reason for this restriction of opening is that the air must be given sufficient velocity to create a strong draft all the way to the floor.

Because conditions at any doorway will be peculiar to that opening, it is not possible to standardize on any design for this fly chaser. Rather, the size of motor, capacity of blower, and design of hood and vanes should be worked out to suit the individual case. It is also well to remember that this method works best when applied to protected doorways, and is not suitable for doors exposed to the full blast of the wind and weather.—Victor Buhr, *New York, N. Y.*




**An effective fly chaser for doorways that are out of the wind can be built by following the general scheme shown in this sketch.**




**Installing a trip switch like that shown in this sketch avoids the possibility of damage when packages on a conveyor start to jam.**

# UNIFORMS

## *How shall they be handled?*

UNIFORMS of either standard or special design are coming to be regarded as required wearing apparel in all types of food manufacturing and packing plants. Their use promotes sanitary working conditions, safety to the worker and an improved personnel morale.

In spite of the extensive use made of uniforms by companies in the 30-odd branches of the food industry, a wide difference in policy exists as to: 1. Who shall pay for the uniforms? 2. Who shall be responsible for the laundering? 3. Who shall decide upon the design of the uniform or how often it shall be changed? 4. Shall uniforms be worn by both men and women employees and shall the same rules apply to both groups of workers?

The diversity of answers to these questions published in the May and June FOOD INDUSTRIES indicates the variations in policy followed by the several companies regarding uniforms. The practices discussed in the two replies which follow do not vary greatly from those covered by some preceding replies yet there are differences which are significant.

### *Regulations Should Be for Both Men and Women*

Uniform and laundry regulations should apply to men as well as to women workers.

In our production operations the company pays for the uniforms and assumes the responsibility for their laundering. It is our feeling that forcing the employee to pay for the uniform is a severe tax upon his or her earnings and gives rise to a mental resentment toward the employer.

Also, when the company pays for the uniforms we are assured of proper appearance among the employees. Company owned garments may be readily rejected when stained or badly worn, whereas, if the employee owns the uniform, an attempt would be made to retain it as long as possible to keep from purchasing a new one.

Making the company responsible for laundering further stresses cleanliness and uniformity of appearance among the employees. Entrusting laundering to each employee is like having too many cooks in the kitchen. Some workers will always forget their responsibility and thereby lower the appearance standard of the entire group. Also, workers differ in their methods and tastes of laundering, thereby adding to non-uniformity. The company should appoint one or more employees and make them responsible for all laundering in accordance with standards set up by the production or personnel manager.

The production manager should decide upon the design of the uniform and when or how often it should be changed. His decision should be made only after consultation with the foreman and forelady of the plant and perhaps a few of the more capable employees. The production manager's decision then would reflect a cross-section of the laundry needs of his plant activities.—LEO D. OVSON, *Ovson Egg Co., Chicago, Ill.*

### *Employees Buy Own Uniforms; Company Launders*

Adoption of uniforms for employees in a medium-sized Midwestern food plant has been largely an experiment in employee participation in managerial matters.

Until about ten years ago no standard uniform was worn by either men or women workers. From among the girls and women workers came an agitation for a uniform which would protect their dresses, be comfortable to work in, and would identify the foreladies of the four departments in which a total of about 200 girls and women worked.

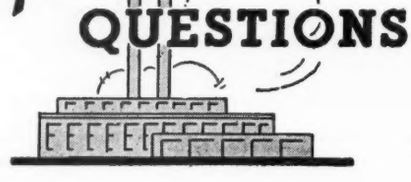
The agitation was viewed with skepticism by the management, which had previously tried to impose a uniform of its choosing upon the employees and had failed to get employee compliance after a few months.

Encouraged by the plant superintendent, a representative committee of the foreladies and women workers arranged with a local manufacturer of general-use aprons for the making of an apron which met their approval and could be bought for $2 each at wholesale prices. Special caps to match the aprons were supplied at 25 cents each.

By color of trim both the aprons and the caps indicated that the wearer was either the head forelady, a supervisor, or an operator.

The uniforms were actually purchased and stocked by the company purchasing department but the sale of them to the employees was under the jurisdiction of the chief forelady. The employees from the beginning have willingly bought the uniforms at the wholesale cost to the company and for a time took care of laundering them. But during recent years the company has them laundered at company expense in order to back up the forelady in insisting that the uniforms be changed as often as is necessary to keep the employees looking neat and clean with the uniforms in good repair and appearance.

Changes brought about in the plant through uniforming of the women, resulted in the men and boys adopting a standard overall, jacket and cap outfit which has proved highly satisfactory and is sold through the time clerk at wholesale prices to the employees. This outfit too is laundered at company expense.




**Next Question**

*What is the best way to organize and carry on safety work in the plant to get employee cooperation and to keep accidents low in number as well as in amount of damage done?*

# New DISCOVERIES AND INVENTIONS

## BEVERAGES

### *New Way to "Cut" Essential Oils*

IN MAKING BEVERAGES from the juice of oranges, lemons, limes or other citrus fruits, or concentrates from which the beverages can be prepared, the natural flavor is enhanced by incorporating a suitable proportion of the essential oil from the fruit in the juice or pulp. A preferred method for incorporating the insoluble essential oil in the juice or concentrate is to prepare separately a solution of the oil in a small amount of isopropyl alcohol, and introduce this solution into the juice preparation. This method, as disclosed in British Patent 456,962 (granted Feb. 11, 1937 to J. S. Bailey, 10 Maids Causeway, Cambridge, England), claims to improve flavor and aroma by uniformly dispersing the essential oil in the beverage.

### *New Method of Preserving Beverages*

A COMBINED chemical and physical treatment for clarifying, sterilizing and preserving moderately acid beverages has been developed by C. Jeanprost, as disclosed in his British Patent 456,075 (granted Jan. 28, 1937). The invention is applicable to fruit juices, cider, musts and wines and consists in removing the phosphorus and nitrogen nutrients so that growth of the micro-organisms is halted.

In a grape must, wine or cider, in which sterilization has been thus effected, the treatment has a preservative effect by stopping fermentation at the point where its benefits are retained without permitting the action to go too far.

The treatment consists in adding an agent which is chemically similar to the zeolites used for softening water, and removing the resulting precipitate. The zeolites are double salts, for example salts of iron and aluminum or of iron and titanium. In one example a grape must, charged with sulphur dioxide, is treated to remove the sulphur dioxide and sterilized by treatment with air and phosphoric acid in an affusion or spraying apparatus. A basic phosphate or tartrate of iron and aluminum is then added and the clear liquid is separated from the precipitate. In another example, the fermentation in cider is halted by sterilization with a phosphate of iron and aluminum.

## CANNED & FROZEN FOODS

### *Sugar and Starch as Sources of Spoilage Bacteria Show Improvement*

NINETY-ONE SAMPLES of beet and cane sugar, of which 25 came from a factory which was canning sweet corn, were tested for spoilage bacteria. Although all three types of spoilage organisms—"flat sour," "thermophilic anaerobes," and "sulphide spoilage"—were present in the samples of sugar, their numbers were so small that only seven samples failed to meet the standard for "sulphide spoilage" organism set by the National Canners Association as acceptable. Only one sugar sample failed to meet the Association specification for thermophilic anaerobes, but nineteen samples contained too many flat sour organisms to qualify as satisfactory sugar for canning. All of which is taken to indicate considerable improvement in production of sugar of good bacteriological quality.

Starch also had plenty of these same organisms and would have been considered unsatisfactory by the same standards as applied to sugar, but the organisms did not seem to be as potent producers of spoilage as those from the sugar. Thermophilic anaerobes were the most plentiful.

Digest from "Thermophilic Canned Food Spoilage Organisms in Sugar and Starch," by F. M. Clark and F. W. Tanner, *Food Research*, 2, 27, 1937.

### *New Maturity Test for Peas*

THIS TEST is a simple, quick, accurate method of measuring the maturity of raw peas, requiring but fifteen to twenty minutes compared with two to three days required for other standard methods. Duplicate tests agree within a few hundredths of 1 per cent as compared with standard methods where duplicates deviate from each other by from 1-5 per cent or more.

The basic principle of the test is the fact that the specific gravity of a sample of peas is directly proportional to the starch/sugar ratio of the sample; also that the higher the starch/sugar ratio or the higher the specific gravity, the poorer the quality of the raw material. Procedure involves a very accurate determination of the specific gravity of 500 grams of peas by the displacement method. The peas are poured carefully into an accurately measured quantity of water in a glass cylinder. Then more water is added from measuring devices until a mark is reached.

Specific gravity is computed by dividing the weight of the peas (500 grams) by the cubic centimeters of water displaced by the peas. Very important is the use of suspended needle-pointed rods for the marks, which makes for an accuracy of one drop of water. Data presented indicates that the tests were made after grading the peas to customary canning sizes. The test is accurate to the fourth decimal place!

Digest from "A New Maturity Test for Peas" by S. L. Jodidi, of the Bureau of Plant Industry, U.S.D.A. *Journal of The Franklin Institute*, 223, 593, 1937.
(A more complete review of the method will be published later in FOOD INDUSTRIES.)

### *Color of Tomato Products*

AFTER CONSIDERING SEVERAL COLORIMETERS for grading canned and dried tomatoes according to color, preference was given to a simple Lovibond tintometer. The instrument was modified somewhat to compensate for surface irregularities in canned tomatoes, tomato paste and the like. The simple but effective change consisted in adjustably interposing a doubly convex lens between the eyepiece and the sample, thus bringing the object out of focus and presenting to the observer a uniform color impression.

The samples examined with this instrument were: a selected tomato concentrate, 35 per cent solids; an extra choice concentrate, 27 per cent solids, a 50:50 mixture of these two; an experi-

(*Turn to page 423*)

# Letters to the Editor

## "Rope" Spores in Milk

Rochester, N. Y.—In FOOD INDUSTRIES for April, 1937, you published an article entitled "Count the Spores." In the course of this article the statement is made that experimenters of the Ward Baking Company had never found "rope" spores in their milk products.

To me this statement is a surprise, as we at the Worcester Baking Company have distinctly traced "rope" trouble to a certain skim milk powder.

The "rope" bacteria were identified with the milk and were found in the milk products. Bread made with this milk powder as an ingredient developed "rope" within 24 hours under summer conditions. Bread made without the milk developed no "rope" whatsoever. Biological chemists identified the spores in the milk and bread as being of the same bacteria.

Furthermore, the writer has found that when this milk is used, "rope" may develop at any time. This milk comes from the West Coast. I understand that the "rope" in the milk from that section results from alfalfa feeding. Those who made this statement claim that rope spores are always present in large numbers in alfalfa and that the spores get into the milk as dust in the course of feeding.

I don't know anything about that. However, I am positive that "rope" is present in milk products as well as other bread ingredients and that this "rope" in milk can contaminate bread products made with it as an ingredient. —CHRISTIAN W. SCHMITT, *Town Talk Bakery, Inc., Rochester, N. Y.*

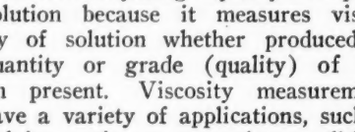
## Testing the Jelling Power of Pectin

Newark, Del.—On page 204 of your April issue we note your digest from a "New Rapid Method for Measuring the Jelling Power of Pectin," *Chemiker-Zeitung*, 61, 49, 1937. We wish to criticize any such method which depends upon a coagulation or precipitation test for pectin jelling capacity. Quality of pectic material present affects jellation as well as quantity. Speed of jelling is controlled by buffers and pH rather than being an index of jelling capacity. The "new method" proposed depends upon quantity of pectin and speed of jelling which makes it comparable to the alcohol or Epsom Salts tests which have been recommended as an indication of sugar supporting capacity for household use for years. In household use, it was difficult for the housewife to judge the results of her tests after she had made them, and we feel that the distinctions between the jelling by this "new method" of pectin solutions containing 0.8, 1.7, or 3.5 per cent calcium pectate will be just as vague to the commercial user as the alcohol test was to the housewife.

After reading the original article from which the digest was made we have concluded the "Jellying Liquid" which is used in the "new method" and which is described as "a heavy liquid capable of forming fruit jellies" but containing no alcohol or sugar is Epsom Salts or a similar salt. We have written the editor of *Chemiker-Zeitung* to find out the name of the inventor of the "Jellying Liquid" and also its composition.

We feel that the proposed applications of this "new method," that is, the grading of pectic extracts or preparations and the grading of pomaces, and the advantages of inexpensiveness and testing are fully met by a capillary viscosity determination according to our own method. A viscosity measurement indicates the jelling capacity of a pectic solution because it measures viscosity of solution whether produced by quantity or grade (quality) of pectin present. Viscosity measurements have a variety of applications, such as judging optimum extraction conditions, grading pectin preparations or pomaces, following the course of pectic hydrolysis, effect of salts, etc. The commercial user, if he makes allowances for the history of the sample being tested or controlled, can develop many new applications. The Delaware Method of Jelly Making, as used by the housewife, represents a practical application of a viscosity control method, the secret of success being in the hot extraction of juice at a minimum pH figure and the acceptance of average viscosity values for certain sugar requirements. We feel that the accuracy of the viscosity method far exceeds that of the proposed "new method," which makes use of such indefinite terms as "formation of jelly is medium," "few minutes," "hard jelly," etc.

It seems to us that there should be objections to publicity given to an article wherein the author or inventor is not named and, in this case, to where the new product, the "jelling liquid," is not fully described. — GEORGE L. BAKER, *Associate Chemist, University of Delaware, Agricultural Experiment Station, Newark, Delaware.*




## Flavor Is Correct Basis for Purchasing Sodium Glutamate

Baltimore, Md.—I was interested in your recent note in FOOD INDUSTRIES regarding sodium glutamate compounds. As you say, there are a variety of these on the market, some powdered, some pastes, some liquids, some colored and some decolorized.

As these products are mostly used for flavoring value, to my mind the flavor of any given product on the cost basis is more important than the content of sodium chloride or sodium glutamate.

Some manufacturers have apparently developed methods of manufacturing these products which gives a characteristic flavor which is not reflected by the glutamic acid content. B. W. CLARKE, *The Crosse & Blackwell Company, Baltimore.*

## Caption Was Misleading

New Kensington, Pa.—On page 50 of the June, 1937, issue of FOOD INDUSTRIES appears our advertisement which is built around the Griffith Laboratories' Sausage Test Kitchen. The caption under the photograph reads "Complete 'Wear-Ever' Equipment in the Griffith Laboratories' Sausage Test Kitchen." It has been called to our attention by one of our own men that this caption might be misleading, in that work-tables, mixing machinery, etc., are also shown. We do not manufacture this type of equipment.

The caption is not clear and we would like to go on record to the effect that no inference is intended that all equipment shown in the photograph is "Wear-Ever." What we intended and should have said is that "'Wear-Ever' utensils are used in the Griffith Laboratories, Test Kitchen."—M. G. ARMENTROUT, *The Aluminum Cooking Utensil Company.*

# Food Equipment News

**REVIEW OF FOOD PROCESSING EQUIPMENT, ACCESSORIES, AND SUPPLIES**

### *Acid-Resistant Floor*

FLEXROCK CO., 800 No. Delaware Ave., Philadelphia, Pa., has developed a material, "Rockflux," which permits the construction of acid-resistant, long-wearing floors, of diabase and quartz.

The material can also be used for floor repairs. It is recommended by the makers for all sorts of food plants, particularly dairies, meat packing plants, canning and packing plants, breweries, cheese factories and ice cream plants.

### *Laboratory Mixer*

A HIGH AND LOW SPEED, heavy duty laboratory mixer has been brought out by Laboratory Equipment Co., 148 Lafayette St., New York, N. Y. Speed range is from 0 to 2,500 r.p.m. Motor is 1/20 hp., of universal type. Propeller shaft is 7 in. long, and the propeller has a diameter of 1 5/32 in. Motor and gears are mounted in a casing, provided with a clamp for attachment of the mixer to a laboratory stand or other convenient place.

### *Cleaner for Bottles*

AN INVERTED AIR CLEANER for cleaning new glassware which reaches the manufacturer in sealed shipping containers has been put out by Pneumatic Scale Corp., Ltd., Norfolk Downs Station, Quincy, Mass.

In operation, bottles taken from the shipping cases are placed upright on the intake conveyor. This conveyor automatically feeds groups of six bottles at a time into the upper chamber of a reversing drum (shown in the accompanying photograph, with the holding plates removed from the two chambers). The group of bottles is then turned upside down as it passes to the bottom of the drum during its rotation. When in inverted position, a 60 lb. blast of clean, dry, filtered air enters the bottles.

While these six bottles are being thus cleaned, a second group of six enters the other half of the chamber, which is now on top. When this second set is carried down to the inverted cleaning position, the first set is brought to the top, into upright position, and delivered to the automatic delivery conveyor.

Speeds of operation range from 40 to 120 bottles per minute, depending on the user's requirements and on the size and shape of the bottles being cleaned.

### *Paint Compound*

A COMPOUND which, when mixed with paints, lacquers and varnishes, is said to protect against moisture and corrosion, is being manufactured by Wet-X-Hale Paint-Compound Co., 572 Greenwich St., New York, N. Y.

By using this compound, it is claimed that the paint can be applied directly to a wet surface. The compound will cause the moisture to be expelled and the paint will dry in normal manner. The compound reacts, with the water, absorbing it. Then it separates, brings all the water to the surface, and both compound and water evaporate. This leaves the paint film as an homogeneous cover, avoiding peeling and blistering, or the corrosion of the covered surface.

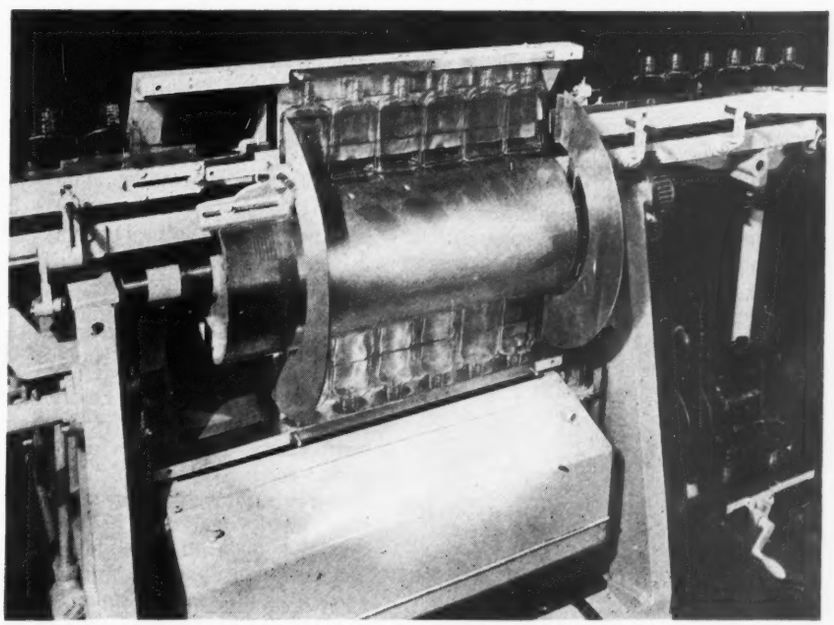
### *Bucket Trap*

SARCO CO., INC., 185 Madison Ave., New York, N. Y., has added an inverted bucket type trap to its line. This steam trap is available in sizes from ½ to 2 in., and the trap is built for pressures of 125 lb. in cast iron, 250 lb. in semi-steel, and 500 lb. in cast steel.

### *Bun Slitter*

FOR BAKERS supplying the hotel, restaurant and lunch counter trade, Battle Creek Wrapping Machine Co., Battle

**Slitter for buns, rusk and other baked products.**



**Inverted air cleaner for bottles.**

Creek, Mich., have developed the "Flash" bun slitter. This automatic machine splits hamburger style or hot dog type buns in half, or leaves them with a hinge, as desired. Feed is by hand, but the machine is otherwise automatic. Capacity depends upon the speed of the operator in feeding the buns.

The makers state that this device is also useful to bakers producing rusks, cinnamon toast and other products requiring slitting.

### *Electrically Operated Control*

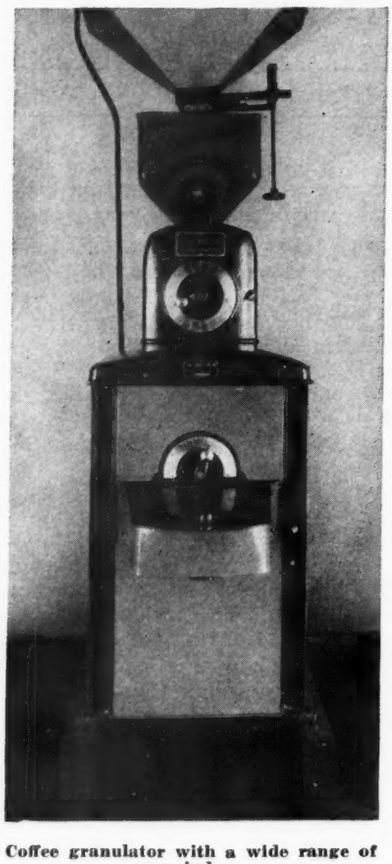
A POSITIVE-OPERATING ELECTRIC CONTACT CONTROLLER, called "Rotax," which can be applied to standard instruments for controlling pressure, temperature, relative humidity, liquid level or flow, has been developed by The Foxboro Co., Foxboro, Mass. A feature of this control is the brush and commutator

**Rotax indicating controller.**

contact, which is said to assure a clean, sliding contact at all times that in no way interferes with the indication or record, yet provides accurate control or signaling. This "Rotax" commutator assembly can be supplied with as many as five disks, thus permitting multipoint control or signaling. The control can be used to operate valves, motors, heating units, signal lights, alarms and other electrically actuated equipment.

### *Coffee Granulator*

A NEW STEEL ROLL GRANULATOR for coffee is offered by Jabez Burns & Sons, Inc., Eleventh Ave. and 43d St., New York, N. Y. This machine, designated No. 26, has a capacity of 500 lb. per hour. It is designed for bulk steel cut grinding in wholesale establishments where a wide range of uniform granulations must be produced. It is said to produce every commercially-needed grind with uniformity.



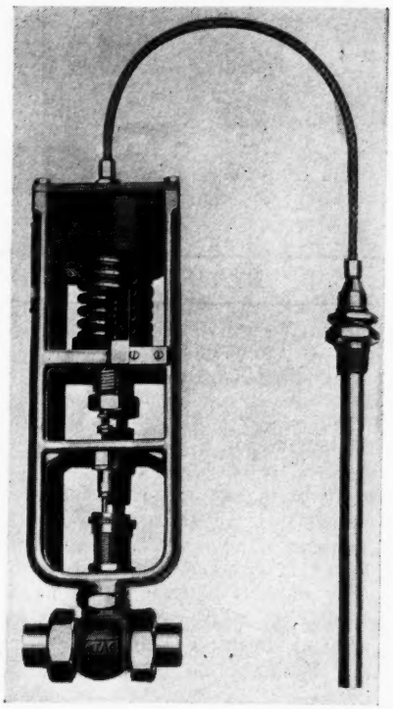
**Coffee granulator with a wide range of grinds**

Advantages claimed for this new grinder are cool grinding with high accuracy; quick adjustability of the cracker to suit the set of the finishing rolls; longer life of rolls; an improved method of chaff reduction; and discharge of a uniformly mixed, homogeneous product in which every pound has the same granular composition as every other pound.

The unit is totally enclosed, has anti-friction bearings, and is 30x50 in. and 81 in. high. Drive is from a 3 hp. motor mounted in the frame.

### *$CO_2$ Recorder*

LEEDS & NORTHRUP Co., 4901 Stenton Ave., Philadelphia, Pa., are now manufacturing a new type of $CO_2$ recording equipment. This makes use of a simplified cell assembly which conditions a flue gas sample by saturating it rather than by drying it. The makers state that this apparatus has high accuracy, quick response in continuous $CO_2$ recording, and is an economical and efficient means of checking combustion efficiency.



**Self-operating controller for temperature or pressure.**

### *Self-Operating Controllers*

C. J. TAGLIABUE MFG. Co., Park & Nostrand Aves., Brooklyn, N.Y., have an improved line of self-operating temperature controllers. A new design of flexible, seamless metal bellows is used in these models. The line is for application where the close control obtainable with auxiliary power is not necessary, or where the steam pressure available is less than 10 lb. per square inch. Temperature ranges are approximately 75 deg. between the limits of 30 and 450 deg. F. The valves are semi-balanced, in sizes from ½ to 2 in.

### *Door-to-Door Delivery*

A MACK, JR., model, designed expressly for door-to-door delivery, is being manufactured by Mack Trucks, Inc., 34 St. and 48 Ave., Long Island City, N. Y. It is designed for gross weights up to 10,000 lb. Wheelbases from 108 to 139 in. are available. The design is close-coupled, permitting weight distribution of 33 per cent at the front and 67

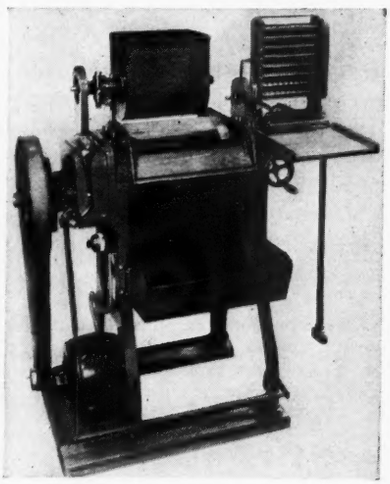
**Door-to-door delivery truck.**

per cent of the total load at the rear.

This truck has an unobstructed interior, so that any desired type of special doors, shelving, racks, partitions and insulation may be used. It is designed for a standard body, 90 to 100 in. long behind driver, 65 in. wide and 60 to 65 in. high.

### *Noodle Machines*

AURELIO TANZI ENGINEERING Co., 235 Fourth Ave., New York, N.Y., are manufacturing noodle machines in three



**Noodle machine.**

sizes for the small producer or retail outlet. These have maximum capacities of 50, 90 and 140 lb. per hour and are called "Little Champion," "Superba," and "Superba 2" respectively. The two latter machines combine the dough mixer, calibrating dough brake and noodle cutter, using a single electric motor.

### *Non-Indicating Controller*

A NON-INDICATING CONTROLLER, called the "Wide Range Controller," is being made by American Schaeffer & Budenberg Division, Consolidated Ashcroft Hancock Co., Inc., Bridgeport, Conn. This instrument is housed in a 4½ in. diameter molded plastic case and was designed for economy and simplicity of installation and operation. It operates on 15 lb. pressure of compressed air and has a throttling range of from 1 to 15 per cent. The temperature type has a graduated range from 30 to 500 deg. F.; the pressure type, a graduated range from 15 to 500 lb.

### *Heavy Duty Roller Conveyor*

MATHEWS CONVEYOR Co., Ellwood City, Pa., are producing two new designs of ball bearing rollers, both for heavy duty. These rollers have self-contained double seals which protect the ball bearings and ball raceways from foreign matter.

Fig. 1 shows Type 63SB, available in

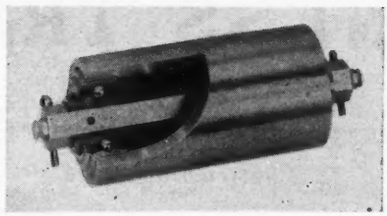


**Fig. 1—Heavy duty conveyor roller which comes in 4, 4¼ and 4½ in. diameters.**

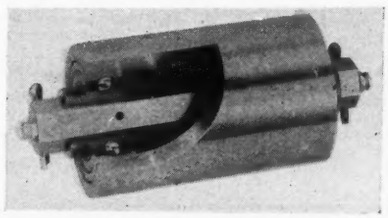


**Fig. 2—Special design of 5 in. diameter conveyor roller which can be used for power drive as well as for gravity.**

4, 4¼ and 4½ in. diameters with continuous load ratings of, respectively, 3,000 lb., 4,000 lb. and 4,500 lb.

Fig. 2 shows the Type 105SB roller. This design includes features similar to those of Type 63SB, and is available in 5 in. diameter. It is for both power-driven and gravity applications. Each roller has a continuous load rating of 8,000 lb.

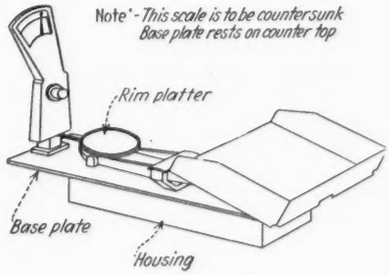
Both of these types employ hexagonal axles which prevent the inner ball raceway from rotating on the axle, which in turn is held stationary in the conveyor frame. Seamless steel tubing is used for the rollers.

### *Packing Scale*

PACKERS of fancy fruits and vegetables, who pack in cartons or mesh bags of 5, 10, or 15-lb. capacity, will be interested in a packing scale now being made by The Exact Weight Scale Co., Columbus, Ohio. Apples, plums, pears, peaches, potatoes, onions and tomatoes are among the products for which the scale is suited. It can also be used for grading oranges, lemons, grapefruit, tangerines and avocadoes by weight for selective packing.

To pack 5 lb. packages with this scale, a 5 lb. weight is placed on the weight platter. Then the commodity tray is filled with produce until the indicator registers exact weight on the scale. It is possible to package with an accuracy of 0.1 lb.

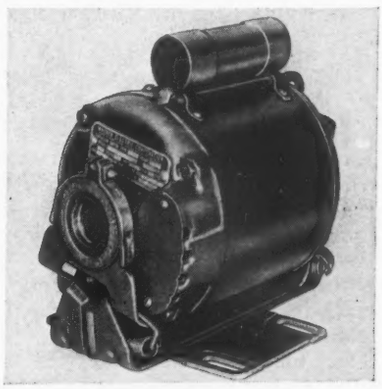
The scale is available in two forms: With countersunk or stationary installation for packing rooms, as illustrated; and with regular base for use on a table top.




**Packing scale.**

### *Resilient Mounted Motors*

A NEW LINE of angular type, resilient mounted motors, in horsepowers from ⅛ to 1 hp., is being manufactured by Wagner Electric Corp., 6459 Plymouth Ave., St. Louis, Mo.



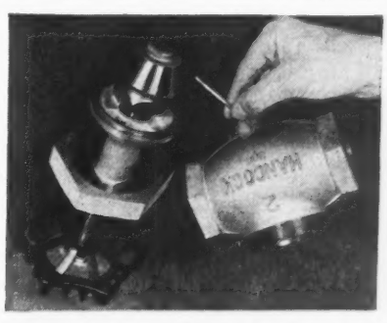
**Motor with resilient mountings.**

These mountings are available in the repulsion-start-induction motors, as shown in the accompanying photograph, and are also made in the split-phase, capacitor and polyphase types.

The purpose of the mounting, formed of large rings of rubber, is to eliminate vibration and noise. The application is to small belt driven machines.

### *Bronze Valves*

THE HANCOCK VALVE DIVISION of the Consolidated Ashcroft Hancock Co., Bridgeport, Conn., have added 1¼, 1½ and 2 in. sizes to their line of bronze "Hancock" valves. The feature of these new valves is that they are equipped with hard stainless steel seats and disks. It is claimed that this hardness enables the valves to smash such foreign material as boiler scale, sand or nails without being marred in any way. The photograph shows a steel nail which the makers state was crushed between the seat and disk of the 2 in. valve.



**"Hancock" 2 in. valve, and nail crushed in the seat without damage to valve.**

# BUSINESS TRENDS

### *Commodity Prices Steady*

READJUSTMENT in the level of inflated commodity prices continued during the last half of May and the early part of June. Professor Irving Fisher's index number of average commodity prices, as announced on June 12, stood at 92, compared to 92.7 four weeks before. The slowness of this decline apparently indicates that a fairly stable condition has been at least temporarily reached. Any violent fluctuations before next fall seem unlikely.

### *Wheat Surplus Uncertain*

WHATEVER THE WEATHER SITUATION between now and the completion of the harvest, it seems certain that there will be some surplus of wheat for export. The size of this surplus is likely to depend mostly on what kind of growing conditions the spring wheat crop encounters.

The June crop estimates of the United States Department of Agriculture indicate a winter wheat yield of 649,000,000 bu., agreeing closely with the average of private estimates. This is a reduction of but 5,000,000 bu. from the May estimates. And, as weather in the winter wheat belt in late May and early June was largely favorable, these figures are likely to be close to final realization.

Spring wheat prospects in early June were not as good. The government's June report indicated a yield of between 175,000,000 and 200,000,000 bu., while private estimates in the first week of June averaged about 230,000,000 bu.

Assuming a median figure of about 200,000,000 bu. of spring wheat to be correct, the total wheat crop this year should be near 850,000,000 bu.

### *Construction News*

| | Pending (thousands) | Awarded June (thousands) | Total Awarded 1937 (thousands) |
|---|---|---|---|
| Bakery | ..... | $40 | $694 |
| Beverages | $40 | 40 | 4,862 |
| Canning and Preserving | 296 | 40 | 880 |
| Confectionery | ..... | ..... | ..... |
| Grain Mill Products | 90 | 224 | 2,006 |
| Ice Manufactured | ..... | 130 | 335 |
| Meats and Meat Products | 75 | ..... | 1,053 |
| Milk Products | 90 | ..... | 4,543 |
| Miscellaneous | 235 | 705 | 5,625 |
| | $826 | $1,179 | $19,998 |

Consumption of wheat in the United States has recently averaged from 630,000,000 to 700,000,000 bu. per year. Consequently, prospects are for an exportable surplus of wheat of 150,000,000 bu. or more. What the effect of this possible surplus will be on the domestic price is anybody's guess until more information is available about prospective wheat yields in Europe and Asia.

### *Fruit Juices Boom*

NO FOOD PRODUCT ever won general consumer acceptance more rapidly than canned fruit juices did. Starting from nothing in 1929, by 1936 the total pack of tomato, pineapple, orange and grapefruit juices had passed 18,000,000 cases per year, with grape juice and some minor products such as prune juice accounting for about 2,000,000 more cases.

The popular vogue of these products has stimulated experiments with other fruit juices and already minor packs of cranberry juice, loganberry juice, plum juice and peach juice have been tried out. But the main growth in the juice pack is still to be looked for among the "big four." Perhaps tomato juice may not greatly exceed in 1937 the 9,000,000 cases that were packed in 1936, but prospects for the 1936-37 pack of grapefruit juice are estimated at around 6,000,000 cases, compared to about 2,500,000 cases the year before. And the pack of orange juice is reported to be increasing at about the same rate.

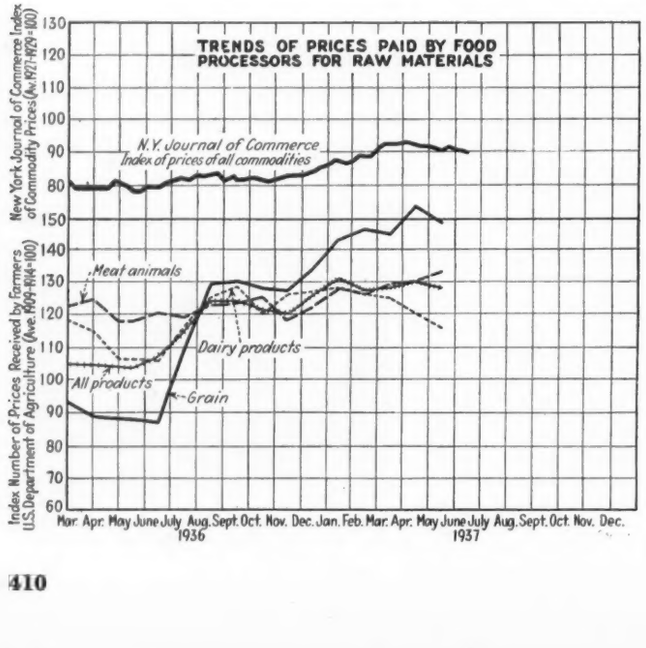
### *Dairy Products Consumption*

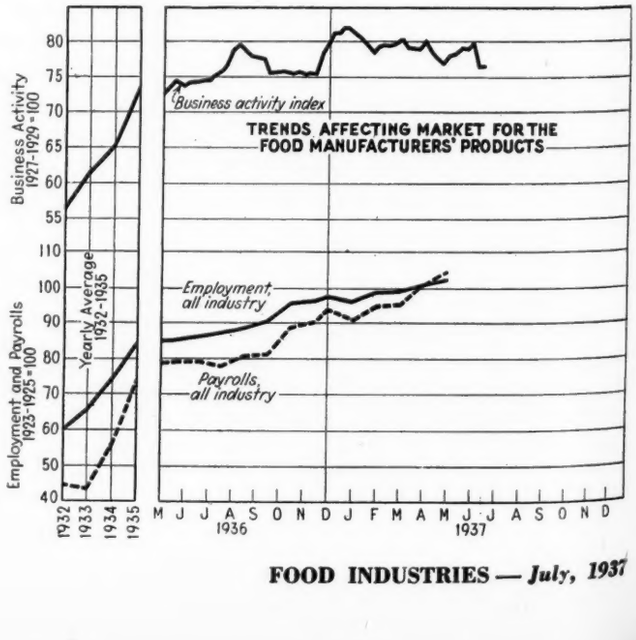
NEW FIGURES for the consumption of dairy products have recently been released by the Bureau of Agricultural Economics. The table follows:

Annual Per Capita Consumption of Dairy Products, 1925–1934
(Figures are for the continental United States)

| Year | Butter, lb. | Cheese, lb. | Evaporated Milk, lb. | Condensed Milk, lb. | Milk Used in Cities and Villages, gal. | Milk equivalent. All Products gal. |
|---|---|---|---|---|---|---|
| 1925 | 17.7 | 4.7 | 11.1 | 2.6 | 38.9 | 92.1 |
| 1926 | 17.5 | 4.7 | 11.5 | 2.8 | 39.3 | 94.6 |
| 1927 | 17.5 | 4.5 | 11.5 | 2.6 | 39.7 | 94.4 |
| 1928 | 17.2 | 4.4 | 12.4 | 2.5 | 39.8 | 94.2 |
| 1929 | 17.4 | 4.6 | 13.7 | 2.7 | 40.8 | 94.3 |
| 1930 | 17.3 | 4.6 | 13.6 | 2.7 | 40.7 | 94.8 |
| 1931 | 18.0 | 4.5 | 13.6 | 2.3 | 40.0 | 96.7 |
| 1932 | 18.1 | 4.4 | 14.3 | 1.8 | 40.0 | 95.3 |
| 1933 | 17.6 | 4.5 | 14.1 | 1.7 | 38.8 | 92.7 |
| 1934 | 18.0 | 4.8 | 15.4 | 1.7 | 37.7 | 92.6 |

This table includes both farm and factory made butter, as well as some butter used in other products such as ice cream. The cheese column omits cottage, pot and bakers' cheese. The evaporated and condensed milk columns include some condensed and evaporated milk used in other products, and also includes both the whole and skimmed milk products. The column giving milk used in cities and villages includes the milk equivalent of cream consumed per capita by that part of the population not on rural farms. This column also includes some milk and cream used in


TRENDS OF PRICES PAID BY FOOD PROCESSORS FOR RAW MATERIALS
New York Journal of Commerce Index of Commodity Prices (Av. 1921-1929=100)
Index Number of Prices Received by Farmers U.S. Department of Agriculture (Ave. 1909-1914=100)
N.Y. Journal of Commerce Index of prices of all commodities
Meat animals
Dairy products
All products
Grain
Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
1936
1937



### *Business Slumps*

REVERSING its encouraging trend of a month ago the curve of business activity abruptly dropped to a new 1937 low during the closing week of May. The drop came within 2.5 points of wiping out the year's advance. After falling to the low of 76.4 per cent of "normal" the *Business Week* index has rebounded slightly and stands at 76.5 per cent for the week ending June 19, a net decline of 2.3 per cent for the five weeks period.

Strikes with consequent interference in production of steel, tin plate, automobiles, and kindred products and declines in carloadings and commodity prices are among the most significant factors in this business activity decline. Consumption of electric power continues to increase. For the week ending June 12 the consumption was 1.8 per cent above that for the corresponding week a year ago and 3.9 per cent above that for the week ending June 5. Building contract awards and check payments have turned upward.

Retail sales continue to be disappointing not only from the standpoint of volume of business done but also from that done on a cash or monthly charge account basis. Collections on installment purchases are slowing up because of decline in business activity. However retail prices continue to advance, particularly in the case of foods. Wholesale price index of foods has also risen during the past month.

Wholesale prices for all commodities reported by the U.S. Department of Labor show a decline of 0.69 per cent for the six weeks period ending June 12. Those for farm products fell 3.30 per cent while food prices fell 0.24 per cent. This price movement parallels that of the weighted price indexes of the New York *Journal of Commerce*. Its general price index dropped 0.88 per cent during the five-week period ending June 19. The index of grain prices shot down 11.03 per cent as that of food turned up 2.64 per cent.

such products as ice cream. Milk fed to calves is deducted from the last column in the table.

EXPORTS OF MAJOR CLASSES OF FOODSTUFFS FROM THE UNITED STATES (1926-'36)
Millions of Dollars
Grains and grain products
Total exports of foods
Meats, fats and oils
Fruits and vegetables
1926 1927 1928 1929 1930 1931 1932 1933 1934 1935 1936

Prices received by farmers are from the U. S. Department of Agriculture. Employment, payrolls, wholesale prices and retail prices from the U. S. Department of Labor. The business activity index is that of *The Business Week*. The cost of living index is from the National Industrial Conference Board. The data on exports of foodstuffs are from the Foodstuffs Division of the Bureau of Foreign and Domestic Commerce.

### *Lard vs. Cottonseed Oil*

IN SPITE of the relatively large stocks of lard on hand, amounting to 195,077,000 lb. on June 1 of this year compared to a 1932-1936 average of 122,175,000 lb., lard prices have risen to reach a point slightly higher than the price of vegetable shortenings made from cottonseed oil.

Such a price relation is unusual and can only be explained by the likelihood of much lower lard production during the next few months and the fact that much of the cottonseed oil that has gone to meet the recently increased demand has been imported.

To offset this, prospects for the 1937 cotton crop indicate an unusually large yield of cottonseed. Consequently, the logical expectation would have been for lard prices at levels likely to move the supply before this large cottonseed oil crop becomes available, and also to offset the usual summer preference for vegetable shortenings. It may be that this level of shortening prices was established without sufficient regard to the future supply situation, and that a fairly drastic price revision is due.

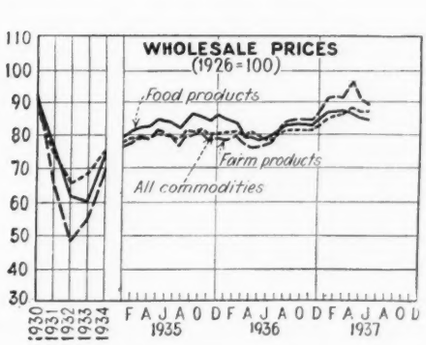
### *Is Candy an Indicator?*

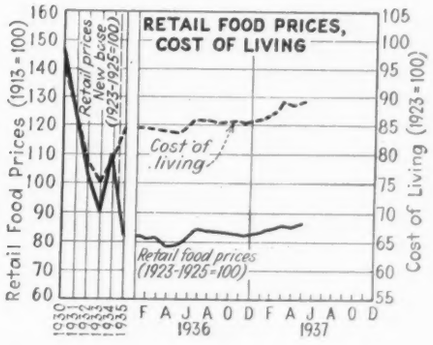
REPORTS REACH FOOD INDUSTRIES from many quarters that the consuming public is more interested in luxury foods than formerly, and that high-priced goods are finding an expanding market.

One indication that this is true may be found in recent statistics of candy sales. The quantity of confectionery sold in the United States has increased each year since 1934 and reached an all-time high in 1936. As was noted last month (FOOD INDUSTRIES, June, 1937, page 335) sales of the higher-priced, or packaged candies, have been increasing more rapidly than other sales.

Figures for the first four months of 1937 show that the upward trend in candy sales continues, as these months showed sales that ran from 8 to 10 per cent above the same months in 1936.

Some of this increase is undoubtedly due to the increase in population. But the increase is so much greater than is warranted by the increase in number of consumers that it would seem definitely to indicate an increased enthusiasm for the purchase of quality foods.


WHOLESALE PRICES (1926=100)
Food products
Farm products
All commodities
1930 1931 1932 1933 1934
F A J A O D F A J A O D F A J A O D
1935 1936 1937


RETAIL FOOD PRICES, COST OF LIVING
Retail prices New base (1923-1925=100)
Cost of living
Retail food prices (1923-1925=100)
Retail Food Prices (1913=100)
Cost of Living (1923=100)
1930 1931 1932 1933 1934 1935
F A J A O D F A J A O D
1936 1937

# INDICATORS

MAYONNAISE, salad dressings and related products sales in 1936 totaled 31,400,000 gal., compared to 28,200,000 gal. in 1935, an increase of about 12 per cent, according to a recent report of the U.S. Department of Commerce.

SUGAR DELIVERIES in the United States, first four months of 1937, totaled 2,488,683 short tons, raw value, according to the AAA. This compares to 2,252,368 short tons, raw value, for the same four months of 1936.

SUGAR EXPORTS from the United States, first four months of 1937, amounted to 23,046 long tons of refined sugar, an increase of 55 per cent over the exports for the same period a year ago.

FLOUR PRODUCTION, May, 1937, as reported by General Mills, Inc., for mills producing about 65 per cent of the total for the United States equaled 5,018,424 bbl., about the same as in May, 1936.

FIELD CORN ACREAGE planted this year is estimated at 99,000,000 acres, which, with an average yield of 25.4 bu. per acre, should give a crop of around 2,515,000,000 bu.

FISHERY PRODUCTS in cold storage on May 15, 1937 were 40,541,000 lb., compared with 34,256,000 lb. on the same date in 1936, and a five-year average of 24,970,000 lb.

BUTTER IN STORAGE, June 1, 1937, was 22,797,000 lb., compared to 21,157,000 lb. on June 1, 1936, and a 1932-1936 average for the date of 29,147,000 lb.

CHEESE IN STORAGE on June 1, 1937, totaled 84,930,000 lb., compared to 70,783,000 lb. on June 1, 1936, and a 1932-1936 average of 59,923,000 lb.

EGGS IN STORAGE, June 1, 1937, totaled 11,084,000 cases. On the same date in 1936 the total was 8,393,000 cases.

MEAT IN COLD STORAGE on the first of June this year amounted to 836,487,000 lb., compared with 550,469,000 lb. a year previous and a five-year average for the date of 712,325,000 lb.

# *Keeping Up* WITH THE FIELD

***Food Bills Get Attention—Sugar Legislation Still Stymied—Confectioners and Cereal Chemists Hold Meetings—FTC Finds Fault***

### *Food Bills Revived*

FOOD AND DRUG LEGISLATION took on new life in the middle of June. And as FOOD INDUSTRIES went to press, the Chapman bill (H.R.300) and the Lea Federal Trade Commission bill were expected shortly to be reported out of the House Committee. It was anticipated that the Chapman bill would be substantially the same as the measure passed by the House during the last session, except that the advertising provisions would be deleted and supplanted by the Lea bill. The latter gives control of advertising to the FTC rather than the Food and Drug Administration. Then the seizure section of the Chapman bill was expected to be strengthened, giving it even more "teeth" than that of the Copeland bill (S.5). As the final food and drug legislation takes shape, the two House bills most likely will supplant the Copeland bill.

### *Sugar Bill in Deadlock*

SUGAR LEGISLATION remains in deadlock. Secretary of State Hull and Secretary of Agriculture Wallace have indicated that they would be willing to meet the House Committee on Agriculture halfway, but Interior Secretary Ickes continues to hold out for the removal of restrictions on the refining of sugar in Hawaii and Puerto Rico.

Members of Congress in cities where domestic refineries are located, backed by both the American Federation of Labor and the Committee for Industrial Organization, are making an active fight to prevent liberalization of refining restrictions in Hawaii and Puerto Rico. And they are insisting upon gradual reduction of imports of refined sugar from Cuba.

### *NCA Considers Problems*

PROBLEMS IN PRODUCTION, distribution, and management filled the program for the National Confectioners' Association 54th annual convention held in Chicago, May 24-28. While the registered attendance did not cross the 5,000 mark, it did set a new high for recent years. That more than 50 per cent of the registrants were manufacturing confectioners indicates an awakening of interest on the part of the confectionery industry as a whole.

**DISTRIBUTION EDITOR**

**Ivan C. Miller of the editorial staff of FOOD INDUSTRIES was appointed Distribution Editor on July 1. With a background of technical training at the University of Wisconsin, followed by ten years of chemical research and process development, he went into newspaper advertising and market research in food distribution. He spent nine years in this activity before joining the staff of FOOD INDUSTRIES last December. Mr. Miller is devoting his entire time to the distribution problems of the food manufacturer. He will be located in the New York office, at 330 West 42d St.**

For the first time, production has been the subject of a regular session period, the whole afternoon of the first day. A full house made this session the best attended of the convention. Stroud Jordan, New York, reviewed developments in ingredient materials, processing equipment and packaging aids for the candy industry. H. J. Melville and Edward M. Johnson, Chicago, pointed out the virtues of engineer-planned plant layouts, up-to-date methods for handling materials and goods-in-process through the plant, and carefully selected processing and packaging procedures.

C. B. Larrabee, *Printers Ink*, New York, discussed the need for better packaging and exposed the weakness of "too many typical candy packages." He stated and defended his opinion that "the confectionery industry today is not getting the most out of packaging." Otto H. Windt, E. J. Brach & Sons, Chicago, emphasized the value and need of standardization in raw-material selection, processing equipment and methods, and production and packaging practices.

In time spent and subjects covered in discussion, distribution problems took up the major portion of the convention program. Special emphasis was placed on the wholesaler's rôle in the marketing of confectionery. Competition that candy has to face from other foods received an unusual amount of attention for a confectioners' convention.

State taxes on candy, Federal legislation, trade practices and the National Labor Relations Act were subjects discussed in the management sessions.

The exposition, which opened a day earlier than the convention, topped that of a year ago by 20 per cent in exhibit space used. Particular buying interest was shown in packaging equipment and materials, indicating that emphasis on distribution and better packaging was not confined to the convention sessions.

Among the 66 exhibits, there was approximately equal representation of manufacturers of raw-material supplies, machinery and packaging supplies.

### *FTC Recommends Reforms*

MANY UNSATISFACTORY CONDITIONS exist in the marketing of fruits and vegetables. That is what the Federal Trade Commission says in the final report on its investigation of the handling of those commodities. And the FTC believes something should be done about it, including amendment of the Perishable Agricultural Commodities Act and amplification of regulatory activities of FTC.

As to the unfortunate conditions existing, the report concludes:

The marketing of a large part of the fruit and vegetable crop is controlled by dealers and others who have financed the production of the products, and such financing is often unfair and unduly costly to the producer. Uncoordinated transportation of produce by motor truck and inability to forecast supplies moving in that manner is one of the

factors resulting in unstable markets. The present terminal market inspection system is unsatisfactory and contributes to the payment of excessive loss and damage claims. In some of the principal terminal markets, the facilities were found to be inadequate, improperly situated and poorly regulated, adding to the cost of distribution and making easier the growth of objectionable "rackets." Practices of certain large buyers, particularly chain-store buying companies, tend to depress prices received by the producer and are often discriminatory in their effect. In addition, various practices in violation of existing law were found.

**Mid-June**

## CAPITAL VIEWS

LABOR PROBLEMS are the outstanding worry of industry everywhere today. The strike situation in June was bad enough, but probably not as bad as will develop before public opinion forces Federal action for disciplinary purposes. Ultimately, compulsory arbitration will be imposed by the Government. But not now. Perhaps not until the union cause has gained control of most of the organizable industry.

LEGISLATION—The Supreme Court battle was lost by the President in the Senate committee. But loss of this battle did not result in an open retreat. Washington does not think that the President, despite pretense, expects to win on this issue later. But the continued threat of a Supreme Court packing demand is very helpful in securing other legislation which is wanted. When boys have been naughty or have disobeyed papa, they are apt to be very sweet and manageable for awhile.

INCOME ESTIMATES—All the Washington evidence points to largely increased cash income for the farmers, increased total factory payrools, and generous evidence of stable high spending power for the majority of the people. Curtailed profits or reduced divi-

*(Turn to page 414)*

### *Cereal Chemists Convene*

POINTED EVIDENCE of the interdependence of food products in production as well as in consumption was shown at the meeting of American Association of Cereal Chemists, at Minneapolis, May 24-28.

Three eminent food chemists were head-line speakers. In the lead-off address on "The Trend of Cereal Intake in the Diet," Alonzo E. Taylor cited the economic status of a country as a major factor influencing the food consumption and dietary habits of its people. Basing his conclusions on comprehensive data on the food consumption of several countries, he showed how the proportion of the income spent for food declines with higher earnings. This statement holds although the total outlay for food products increases with higher earnings. The variation in the family income thus determines the amount, and particularly the type, of food consumed.

Many phenomena in the structure of food constituents and their reactions during processing, which heretofore have been puzzling chemists, may find their solution with the assistance of the scientific evidence presented by Dorothy Jordan Lloyd, British nutritionist, speaking on the "Imbibition of Water by Proteins."

In reviewing "Recent Advances in Biochemistry" R. A. Gortner, University of Minnesota, discussed their effect on the routine of living. He sharply criticized the indiscriminating exploitation of scientific findings for promotion schemes resulting in food fads and misinterpretation by the press and the public, and he emphasized the urgent need for dissemination of more authentic information on foods to the public.

In a joint symposium with representatives of the American Society of Bakery Engineers, at which G. F. Garnatz, Kroger Grocery & Baking Co., presided, both chemists and bakery engineers presented their views on a better "Correlation of Laboratory Baking Test Results With Shop Practice."

William H. Cathcart, Research Department, American Institute of Baking, reported on an extensive series of flavor and taste tests.

Development of the oat-milling industry and the morphology of the oat kernel were described by H. J. Brownlee and F. L. Gunderson, Quaker Oats Co., Chicago, in a paper dealing with the structure and composition of oats, rolled oats and other related products.

Equally interesting, although more specific in its scope, was the session of the malting and brewing chemists. The program was chiefly devoted to the standardization of methods for the determination of diastatic power in malt and to the study of factors influencing the malting quality of barleys by experimental malting methods.

In the course of the week, industrial trips were made to the Hamm Brewing Co., Archer-Daniels-Midland Co., and Creamette Co.

Cincinnati, Ohio was voted the 1938 meeting place of the Association.

### New McGraw-Hill President

EFFECTIVE JUNE 21, James H. McGraw, Jr., was elected president of McGraw-Hill Publishing Co. to succeed Malcolm Muir, resigned. Mr. McGraw, Jr., continues as chairman of the board and assumes the additional responsibilities of the office of president.

Following his graduation from Princeton University in 1915, Mr. McGraw entered the service of the company and for 21 years has served actively in various posts connected with its publishing activities. After eight years of service with individual papers and groups of papers, he entered the general management of the company as treasurer in 1923, and became executive vice-president in 1932. In 1935 he was elected chairman of the board to succeed James H. McGraw, founder of the company.

In 1932 and 1933, Mr. McGraw served as president of Associated Business Papers, and in addition to his work in his own company he has contributed generously of his time and effort to the advancement of business-paper publishing. Thoroughly grounded in the editorial tradition, he has applied himself aggressively to keeping the business paper abreast of what is best in modern publishing practice from the viewpoint of both readers and advertisers.

*Blank and Stoller*

**James H. McGraw, Jr.**

Malcolm Muir is now president of Weekly Publications, Inc.

(*Continued from page 413*)

dends would make no difference, nationally speaking; and even that kind of income is not likely to shrink importantly. All this means generous buying power for food consumers, and consequent probable selection of more luxury types of goods, less stress on price, and more on flavor and appearance.

HOURS AND WAGES—Every straw points toward the enactment this year of several new Federal restrictions on hours of work, minimum wages and child labor. Controlling influences which affect Federal legislation demand a trial of this means for reducing the number of unemployed and raising the privileges of the under-privileged. The reformers will have to try a huge experiment before they will be convinced of the futility of legislating folks out of their laziness and economic complacency. Industry will pay the bill.


Thinshell

on everyone's tongue

Well, maybe we do exaggerate a *little,* but Thinshell confections are definitely making their sweep, demonstrating to the world that here are the wafers and cookies that are good for young and old and stockholders.

Back of the fine product, Thinshell provides smart selling, alert management. In the Thinshell kitchens no recipe, no ingredient, no process and no equipment is good enough when something a little better can be found. We naturally like to think this is why their baking operations are done with the Industrial Carburetor . . . and we know darn well that, this Kemp firing of 100 percent premixed gas and air *does* make their gas bill a heck of a lot lower!

Do we bore you? If not, write for details. Address **The C. M. Kemp Manufacturing Co., 405 E. Oliver St., Balto., Md.**

**KEMP of BALTIMORE**


## CONCENTRATES

• Legislation requiring the name of the country of origin on containers of coffee sold in this country is being seriously considered by the House Ways and Means Committee . . . Bill H.R.-7153 introduced by Representative Frank Buck to put a 3-cent-per-pound tax on imports of preserved beef or veal probably will not be reported out of committee this session of Congress . . . A bill, S.2604, introduced by Senator Capper provides for a tax of 6 cents a pound on imported pork and pork products.

• Protection of the Northern Pacific halibut industry is the object of bill S.1984 which has been favorably reported by the Senate Committee on Commerce and which carries the approval of Secretary Hull and Commissioner of Fisheries Bell . . . A national survey on wage and working conditions in the food manufacturing field is being undertaken by Associated Grocery Manufacturers of America as a preliminary to possible adoption of uniform labor-relations policies.

• Canning and Pickle Workers' Union, AFL affiliate, won the right to represent the 2,300 employees of H. J. Heinz Co., Pittsburgh, in collective bargaining. Following its recent labor trouble, Heinz granted a 10-per cent wage increase, agreed to one-week's vacation with pay at the end of a year's employment, adjusted hours for certain departments and stipulated arbitration of future management-employee disagreements . . . Large meat packers in Chicago recently abandoned their employee representation plans to avoid complications under the Wagner Act.

• A conference on food technology will be held at Massachusetts Institute of Technology, Boston, Sept. 14–17 . . . According to W. E. Aycock, recently appointed Agricultural and Industrial Agent of the Georgia & Florida Railway, it has been discovered that vegetables grown in the fine-clay soil in south Georgia have a superior flavor as a result of the high iodine content of the soil. Thousands of farmers there are turning to vegetable growing.

## CONVENTIONS

**JULY**

12–15—National Confectionery Salesmen's Association of America, Hotel Chelsea, Atlantic City, N.J.

**AUGUST**

18–21—National Food Distributors' Association, Sherman Hotel, Chicago.

22–28—Eleventh World's Dairy Congress, Berlin, Germany.

23–25—American Fisheries' Society, Mexico City, Mexico.

# MEN, JOBS *and* COMPANIES

### *Industry*

» ARMOUR & Co. will construct a $60,000 wholesale meat cooler, sausage kitchen and office at Cincinnati.

» ASSOCIATED MEAT PRODUCERS, INC., Twin Falls, Idaho, recently organized with a capitalization of $2,050,000, is planning to construct a $300,000 meat packing plant.

» BORDEN Co., New York, has developed a system of double-checking all labels to make sure that these provide adequate and accurate information. Raymond Hertwig, former secretary of the Committee on Foods of American Medical Association, has been placed in charge.

» BORDEN Co.'s frozen-egg business has been taken over by Benjamin Titman Corp., New York, which has obtained also the brand names and trademarks of Titman Egg Corp. and H. J. Keith Co., operated by Borden for several years.

» CAMPBELL-TAGGART RESEARCH CORP. has been formed at Kansas City, Mo., by 34 Midwestern and Southern baking plants to establish a research and experimental center.

» CANADA PACKERS, LTD., will spend $650,000 on a new plant at Vancouver, B. C.

» CONTINENTAL BAKING Co. is putting up a $250,000 plant at Little Rock, Ark., in which the district headquarters of the company will be located.

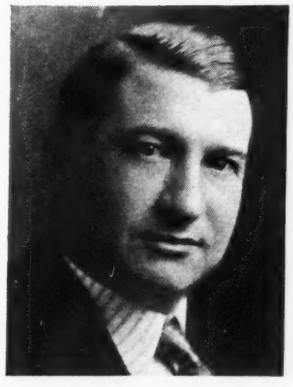
» DOSSIN FOOD PRODUCTS, INC., has completed a three-story, $175,000 addition to its factory at Detroit. The company has also purchased 25 new trucks and other equipment costing $125,000.

» FROEDTERT MALTING Co. has expanded its plant capacity at Milwaukee by 2,000,000 bu. and the capacity of its Winona, Minn., plant by 1,000,000 bu. The company will have a capacity of 14,000,000 bu. when its expansion program is completed.

» GENERAL MILLS, INC., Minneapolis, discontinued on June 1 the corporate identities of the various corporations which functioned as Associate Companies of General Mills, Inc. The names of most of the former companies, however, will be used to designate divisions of the parent organization.

C. H. Bailey

George M. Armor



Eric F. Hazel

W. D. Bost

» HOLLY SUGAR CORP. will spend $2,500,000 in expansion, $2,000,000 of which will be used to build a new 1,500-ton beet-sugar factory at Hardin, Mont., and to rebuild a factory at Alvaredo, Calif.

» KRAFT-PHENIX CHEESE CORP. recently opened a new $175,000 branch office and warehouse at Detroit.

» CHARLES A. KRAUSE MILLING Co. Milwaukee, has sold its feed business to Vitality Mills, Chicago, and will concentrate on corn milling. The company is building a new plant to replace the one recently destroyed by an explosion. This factory will be explosion-proof and of "daylight" construction.

» NEW HAMPSHIRE POULTRY & EGG Co., Manchester, has installed the "endless chain" method of dressing poultry. It is distributing to large centers by truck.

» RUNKEL BROS., INC., New York, recently filed a petition for reorganization under Section 77-B of the Federal Bankruptcy Law. The company operated at a loss of $37,000 last year and of $150,000 in 1935.

» SHEFFORD CHEESE Co. will begin operations July 1 in a new plant at Nashville, Tenn. The plant will handle about 175,000,000 lb. of cream and milk annually.

» SWIFT & Co. is remodeling several buildings of its packing plant at South St. Joseph, Mo. Work on the company's $1,500,000 vegetable-oil refinery at Port Newark, N. J., is progressing, with operations scheduled to start November 1. And construction is under way on the new $750,000 Swift packing plant at Lake Charles, La.

### *Personnel*

» GEORGE H. ARMOR, McCormick & Co., Baltimore, has been reelected president of Flavoring Extract Manufacturers' Association of the United States. L. P. Symmes, Baker Extract Co., Springfield, Mass., was made first vice-president. Other vice-presidents named are A. F. Wussow, Price Flavoring Extract Co., Chicago, and Clark E. Davis, Virginia Dare Extract Co., Brooklyn, N. Y.

» C. H. BAILEY, University of Minnesota, is the new president of American Association of Cereal Chemists. W.

F. Geddes, Grain Research Laboratory, Board of Grain Commissioners for Canada, Winnipeg, was elected vice-president. Oscar Skovholt, Quality Bakers of America, New York, was named treasurer, and J. W. Doty, General Mills, Inc., Minneapolis, was made secretary.

» R. M. BOHN, former director of the Technical Institute of Independent Biscuit Manufacturers Co., is now with Read Machinery Co., Inc., York, Pa.

» W. D. BOST, Orange-Crush Co., Chicago, has been elected president of National Association of Manufacturers of Fruit and Flavoring Syrups.

» WILLIAM BIBBY has been made vice-president of Cumberland (Md.) Brewing Co., and placed in charge of the company's plant.

» E. E. CLIFFE has resigned as chief chemist of Standard Brands, Ltd., Toronto, to teach chemistry.

» ROSCOE H. GODDARD succeeds the late W. P. B. Lockwood as secretary-treasurer of New England Association of Ice Cream Manufacturers.

» ERIC F. HAZEL, Hazel Baking Co., Atlanta, heads up Southern Bakers Association. Ben Pollman, Smith's Bakery, Meridian, Miss., is vice-president.

» ROY Z. HERSHEY is president of the newly organized Ohio Chocolate Co., which is constructing a $15,000 plant at Malvern, Ohio.

» COL. H. E. HORSEY is the new president of Kenosha (Wis.) Coca-Cola Bottling Co.

» MORTON JOHNSON has been named manager of the Stokely Bros. plant at Superior, Wis.

» D. F. KELLOGG has been appointed manager of Merrick Dairy Co., Beloit, Wis.

» CHARLOTTE M. LIBERTY is now secretary and assistant treasurer of Kellogg Co., Battle Creek, Mich. She formerly was private secretary to George C. McKay, who resigned.

» R. C. MINER, Miner-Hillard Milling Co., Wilkes-Barre, Pa., is the new president of American Corn Millers' Federation.

» BROOKS MORGAN has been named manager of the Houston, Texas, bottling plant of Tru-Fruit Distributors.

» J. RICHARDS NELSON, Warren, R. I., heads up National Shellfisheries Association, and Howard W. Beach, New Haven, Conn., is again president of Oyster Growers' & Dealers' Association.

» THOMAS J. PAYNE, Reed Candy Co., Chicago, continues as president of National Confectioners' Association until the board of directors names a successor. At the association's convention, A. M. Kelly, former president of Wallace & Co., Brooklyn, N. Y., was reelected executive vice-president. George T. Peckham, National Candy Co., Inc., St. Louis, was named vice-president, and H. R. Chapman, New England Confectionery Co., Cambridge, Mass., was reelected vice-president. Herbert G. Ziegler, George Ziegler Co., Milwaukee, was elected treasurer, and Max F. Burger, was again named secretary.

» H. G. SCHNEIDER, Laurel Biscuit Co., has been elected president of Biscuit and Cracker Manufacturers' Association.

» J. W. SCHWAN, former manager of Niagara Falls Milling Co., Lockport,


*They got what they wanted . . .*

When the food industry required a *tight-seal* cellulose wrap that would give foods a higher degree of protection than was formerly possible . . .

*they got what they wanted from the Package Machinery Company.*

When the chewing gum industry wanted easy-opening devices for slitting the cellulose wrap on chewing gum packages . . .

When the toilet soap manufacturers required a high-speed machine capable of wrapping cakes of soap in a combination of several wrappers . . .

When the manufacturers of products that are difficult to wrap—tender yeast cakes, small pieces of candy, wafer-thin razor blades, etc.—required machines that could turn out the thousands of pieces needed daily . . .

When package goods manufacturers sought wrapping machines that could be adjusted to wrap more than a single size package . . .

When they wanted a machine that could wrap packages in printed transparent material, locating the printing accurately on the package . . .

*they got what they wanted from the Package Machinery Company.*

What can we do to improve your package or lower your costs? We will be glad to tell you if you will send us a sample of your product with a brief description of your present packaging methods.

*Write for Literature*

PACKAGE MACHINERY COMPANY
SPRINGFIELD, MASS.

NEW YORK CHICAGO CLEVELAND LOS ANGELES
Mexico, D. F., Apartado 2303.
Melbourne, Australia: Baker Perkins, Pty., Ltd.
Peterborough, England: Baker Perkins, Ltd.

**PACKAGE MACHINERY COMPANY**
Over a Quarter Billion Packages per day are wrapped on our Machines

N. Y., has become manager of Lakeside Milling Co., Wilson, N. Y.

» PERRY SHARP, Jung Baking Co., Joplin, Mo., is the new president of Independent Biscuit Manufacturers Association.

» GEORGE B. SHAFER recently was elected president of Merrill (Wis.) Canning Corp.

» B. R. SMOOT has retired as general superintendent of the plants of Utah-Idaho Sugar Co., Salt Lake City. He is succeeded by Wilford Y. Cannon, formerly assistant general superintendent. Mr. Cannon, before joining Utah-Idaho Co., was general superintendent for Amalgamated Sugar Co., Ogden, Utah.

» HERBERT L. TREEMAN has been made vice-president in charge of operations for Hathaway Bakeries, Inc., Cambridge, Mass.

» ROSS TRULLINGER has been appointed by Armour & Co. to serve as general manager and superintendent of its plant in Birmingham, Ala., succeeding E. H. Meyers and J. M. Borger.

» MARVIN VERHULST has taken the position vacated by Harvey H. Burr as executive secretary of Wisconsin Canners' Association.

### *Deaths*

» JOHN C. CAMPBELL, 41, secretary and treasurer of Mountain City Mill Co. and general manager of Chattanooga Bakery, Chattanooga, Tenn., May 30.

» HENRY C. GILLES, 78, founder of H. C. Gilles & Sons, Bridgeport, Ohio, June 4.

» JACOB W. HIRNING, 60, manager of General Baking Co., Providence, R. I., for twelve years, May 21.

» ELLSWORTH T. JOHNSON, 69, president of Onalaska Pickle & Canning Co. and Galesville Canning Co., at La Crosse, Wis., recently.

» KING MCCREERY, 70, secretary-treasurer, Snyder-Chaff Candy Co., Columbus, Ohio, May 21.

» FRANK O. MILLER, 59, president of Blue Ribbon Candy Co., Atlanta, May 19.

» ROBERT S. SINCLAIR, 64, chairman of the board of Kingan & Co., Indianapolis, May 14.

» J. C. WHALEY, 77, president of Gainsville (Tex.) Milling & Elevator Co., May 14.

» ALLEN WINCHESTER, 57, president of Winchester Packing Co., Hutchinson, Kan., for 35 years, May 28.

### *Associated Industries*

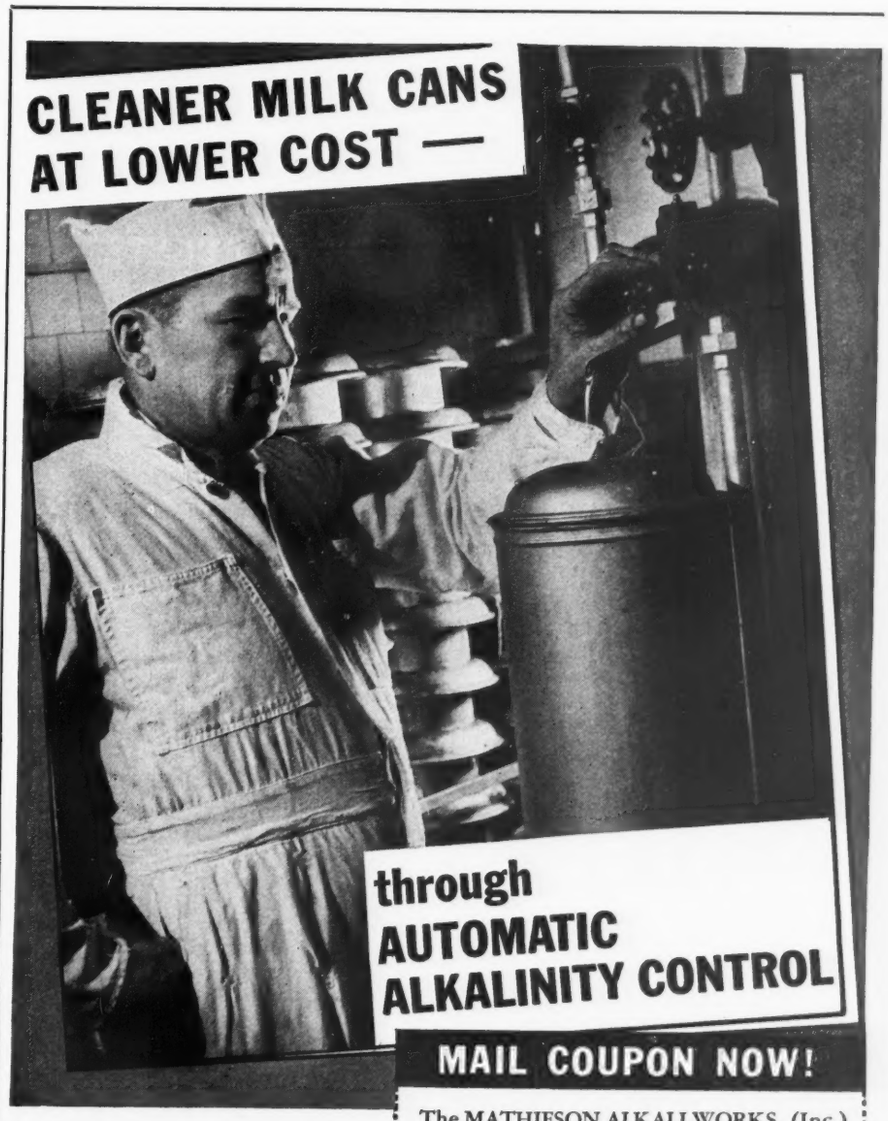
» BROWN INSTRUMENT CO., Philadelphia, has appointed E. B. Evleth as vice-president and general manager.

» PATTERSON FOUNDRY & MACHINE CO., East Liverpool, Ohio, plans to double production facilities within the next two years.

» CELLULOID CORP., New York, has appointed Ralph S. Gavitt New England district manager and William M. Porter acting director of sales of the plastics division.

» CRANE CO., Chicago, has established a valve and fitting department, with W. H. Page as manager.

» SYNTRON CO., Pittsburgh, is moving its plant and offices to Homer City, Pa., where it has purchased a larger, modern plant.


MAIL COUPON NOW!

HOW clean your milk cans are washed, how long they remain in service, how much you pay for cleanser—all depend upon how well you control the strength of the solution in your mechanical can washer. This bulletin describes an entirely new automatic alkalinity control that is simple, accurate and thoroughly practical. Send for your copy today and see how easy it is with the Lehmkuhl system to turn out cleaner milk cans at lower cost.

The MATHIESON ALKALI WORKS, (Inc.)
60 East 42nd St., New York, N. Y.

Please send me a copy of your new bulletin, "Cleaner Milk Cans at Lower Cost".

Name .....

Company .....

Address .....

City ..... State .....

## Social Security

(*Continued from page 379*)

ords with the old age benefits records.

An important incidental feature of the withholding of employee taxes from the payments to workers has caused some confusion. Federal regulations require that each employee be given notice in writing at each time when he receives a payment, indicating the amount which has been withheld from his wages.

For seasonal employees and those who do piece work there are no special rules or principles different from those which govern regular full-time workers. No matter how brief the employment of any individual, the business record of a company must show his name, his individual account number, and his remuneration.

This situation has developed a number of complications for food enterprises such as canners working transient employees for a short season. If the floating workers are engaged by two or three or more employers in the course of a year, then each employer treats the individual just the same as though he were a full-time worker. Not only their wages, but their housing and free meals, if any, are included, together with any other special emoluments or remuneration. At the end of the month the required report forms are made out with an indication of the number of individuals involved (not the number of payroll items, of which there may be many more than of individuals).

Piece workers are treated just like those on a salary or a weekly or hourly wage. If the piece-work compensation is arranged by brass check or other token, then the money value of this is the thing that counts. And the company record must show to whom this remuneration went.

Some plants pay peelers of tomatoes by a brass check which is worth a given sum of money when turned in to the office cashier. In certain localities these brass checks are recognized even outside the plant as almost as good as currency. But Uncle Sam is not interested in the brass check nor how it is handled, who cashes it or where, but does demand that the company record and its report show the money value of the check and the name of the individual *to whom it was given.*

And then some employers ask how about those employees who refuse to participate, raise so much fuss about deductions that the boss hardly knows what to do. There is an easy "out" for that one too. If the employer chooses to assume responsibility for the 1 per cent now legally deducted from employees' salaries, he may do so. Uncle Sam will regard as merely a gift from employer to employee the undeducted per cent. In the case of seasonal employees who do not understand what this is all about, that is a simple, and in many cases perhaps not unduly costly, means of avoiding explanations for deductions. But the payment made monthly for federal taxes on employers and employees, and the required reports and remittances to state tax collectors for unemployment compensation, will be just the same.

There has been no formal ruling yet at the treasury as to whether this 1 per cent gift is a legitimate item of "cost" of doing business. One may reasonably think that it is such, but sooner or later it may be ruled as coming out of *profits* and not being a part of deductible business *expense* when figuring income taxes.

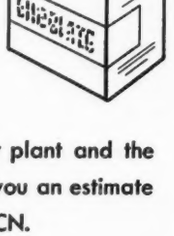

LIQUID HCN *Kills all insects*

that infest stored food products

AT A COST OF A FEW CENTS

If you store or handle large quantities of cocoa beans, chocolate, dried fruit, nuts, cereals, cereal products, candy, or confectionery in any form, you know how easily they can become infested with insects. You know too how quickly these insects spread and contaminate the entire factory, and how ordinary methods of pest control are comparatively expensive and inadequate.

LIQUID HCN—the all-purpose pest destroyer—is a powerful and concentrated fumigant which kills these unsavory pests (as well as rats and mice) at a very low cost—a split-fraction investment compared to the savings resulting from the thorough control LIQUID HCN always gives. Many leading importers and manufacturers have standardized on this form of fumigation as not only the cleanest and most efficient, but the lowest in cost.




If you will send us the complete dimensions of your plant and the kind of goods you handle, we will be glad to give you an estimate of the cost of complete insect control with LIQUID HCN.

**AMERICAN CYANAMID & CHEMICAL CORPORATION**

*Insecticide Department*

Manufacturers of LIQUID HCN - ZYKLON DISCOIDS - CYANOGAS

30 ROCKEFELLER PLAZA, NEW YORK, N. Y.

LEAVES NO RESIDUE TO AFFECT ODOR, TASTE, OR COLOR

## Mind Your Paint

(*Continued from page 387*)

which time observations and records are made for appearance of a zone of clear agar around the painted rod. Such zones are indicative of diffusibility of inhibitory property.

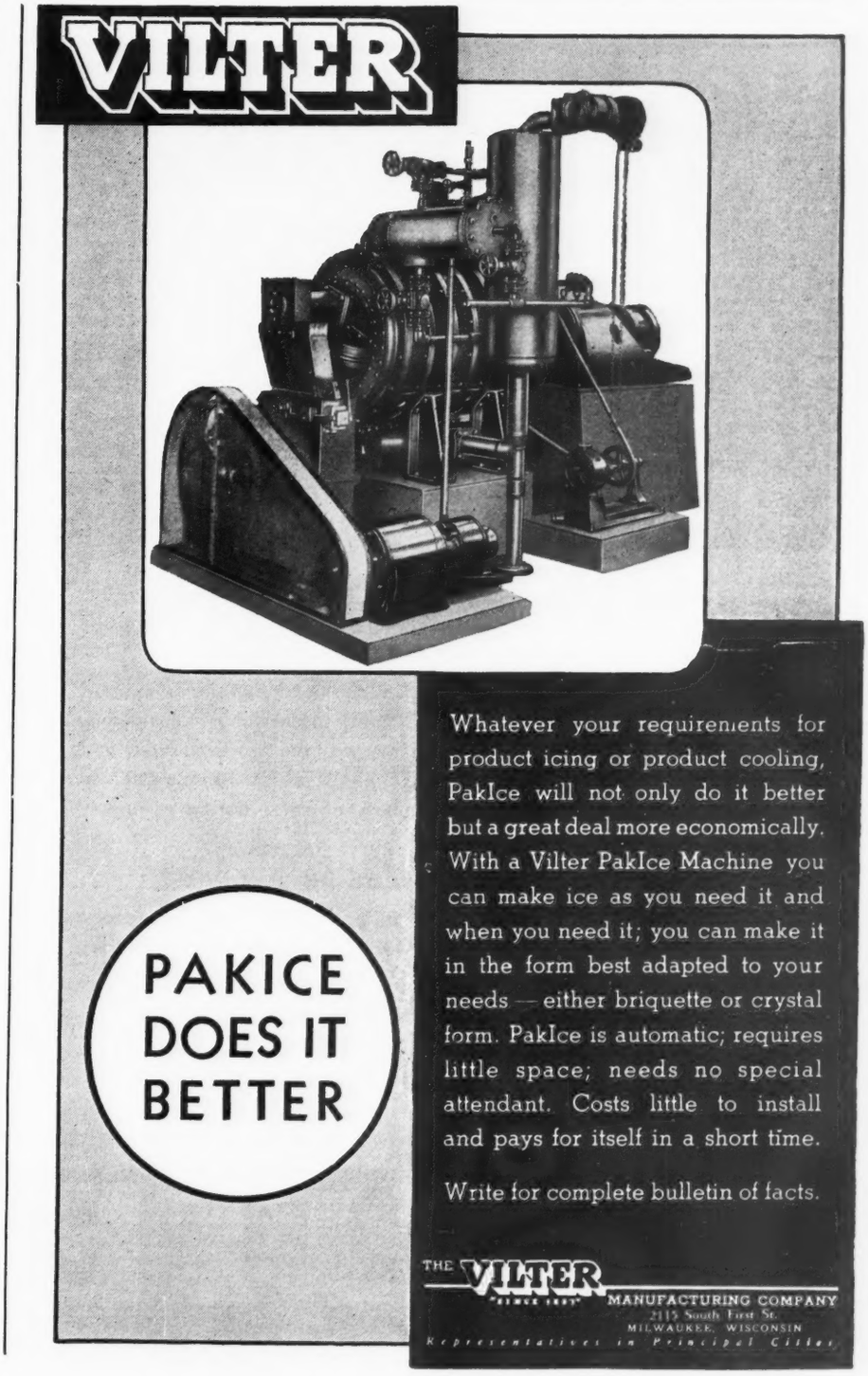
By means of the method just outlined, the bactericidal property of halogenated oil paints as compared to general-use commercial paints has been demonstrated when tested against *Staphylococcus aureus* No. 209.[6] Reproductions of actual photographs are shown in Fig. 1. Germicidal paints No. 1 and No. 2 were slight modifications of paints "A" and "C" used in the published investigation.[8]

A third investigation concerns tests on a paint having a 4 per cent halogenated oil base with regard to its influence on the growth of a resistant spore-producing type of bacteria and strong-growth molds as compared with a number of ordinary general-use commercial paints. The bacteria used for testing included four strains of *Bacillus mesentericus*. One was isolated from "ropy" bread and obtained from the Great A. & P. Tea Co. laboratories. The others were varieties *viscusus* and *fuscus* (obtained from Yale University bacteriological laboratories) and *flavus* (obtained from the American Type Culture Collection) and a strain of *B. subtilis* (obtained from Yale University). Two strains of *Aspergillus niger* were tested. One was obtained from Fleischmann's Laboratories and the other we isolated from fruit.

The method of determining the germicidal qualities of paint in these studies was that worked out by I. Wetchler. Saline suspensions from seven-day agar slant cultures were used as the inoculum. The bacteria were tested in both "spore" and "vegetative" morphological stages. The number of organisms seeded to 20 c.c. of sterile melted nutrient agar varied from 2 to 20 million as determined by haemacytometer counts or by colony counts derived from serial dilutions. This inoculum gave unquestioned crowded growth. Observations of growth were made after one, two and four days of 30 deg. C. followed by incubation at room temperature for seven days.

In making this test the influence of paint on the growth of molds, a technic was devised to approximate practical conditions but in very much aggravated circumstances. One hundred milligrams of stale bread ground in a mortar and passed through a 0.5 m.m. mesh sieve were placed in a sterile test tube. Three c.c. of a saline suspension containing approximately one million mold spores per c.c., as determined by haemacytometer counts, were then added. The contents were thoroughly mixed and poured into a petri dish, the inner part of which had been painted with one coat and dried for 13 and 33 days. The saline suspension of ground bread and mold spores were then distributed over the painted surface as uniformly as possible. The seeded petri dish bottom was covered with an unpainted petri dish top, and kept at room temperature for observation.

Experiments with these bacterial suspensions showed that none of the eight ordinary general-use commercial paints tested after drying for fifteen days had any effect in inhibiting the growth of the test organisms. No zones of inhibition were noted after 24 hours incubation at 30 deg. C. The halogenated oil paint after drying for 64 days definitely in-



VILTER
PAKICE
DOES IT
BETTER
Whatever your requirements for product icing or product cooling, PakIce will not only do it better but a great deal more economically. With a Vilter PakIce Machine you can make ice as you need it and when you need it; you can make it in the form best adapted to your needs — either briquette or crystal form. PakIce is automatic; requires little space; needs no special attendant. Costs little to install and pays for itself in a short time.
Write for complete bulletin of facts.
THE VILTER MANUFACTURING COMPANY
2115 South First St.
MILWAUKEE, WISCONSIN
Representatives in Principal Cities

hibited the growth of the test organisms and produced areas of inhibition of 5 to 8 m.m. distance from the imbedded painted glass rod after incubation for four days at 30 deg. C. The clear zones were not changed after prolonged incubation at room temperature. Reproductions of actual photographs of some of the results of these tests are in Fig. 2.

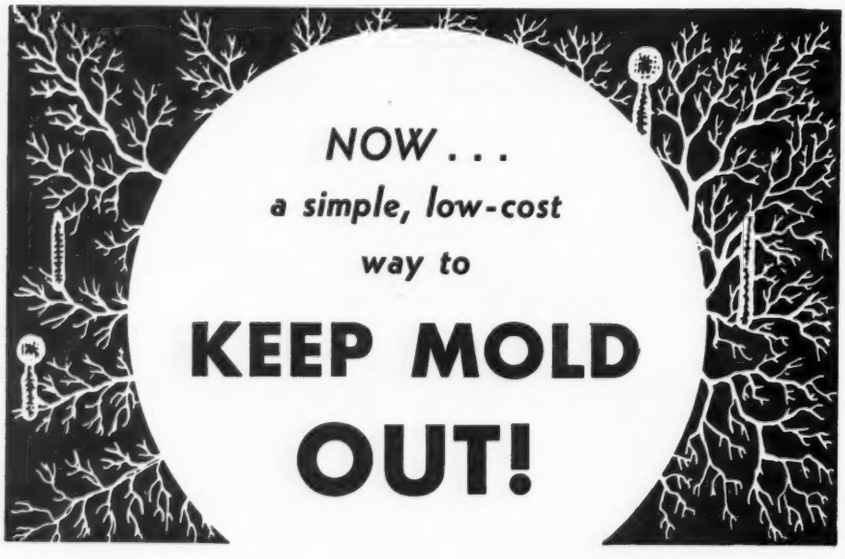
Results of the experiments on the effect of paint on the development of mold spores of two strains of *Aspergillus niger* concurred with those on the effect on bacterial growth. Only six general-use commercial paints were compared with the germicidal paint. The paints had dried for thirteen days prior to the test. Four days after planting suspensions of ground bread and mold spores marked development of both strains of *Aspergillus niger* were observed on the general-use commercial paints but no sign of growth was noted on the germicidal paint. After standing at room temperature for 55 days the plates coated with a halogenated oil paint were still distinctive by absence of any sign of mold development. Reproductions of actual photographs of the results of these tests are shown in Fig. 3.

The experiment on molds with germicidal paint was repeated in duplicate after the paint had dried 33 days. This time 1 c.c. quantities of sterile water were added to the seeded plates four and eight days after inoculation with suspensions of ground bread and mold spores. Up to 45 days after inoculation, no sign of mold growth can be observed.

These experimental results indicate that ordinary general-use commercial paints have no inhibitory effect on the growth of the tested microorganisms, whereas paints containing 4 per cent halogenated oils unquestionably inhibit the development of these same microorganisms. The results are significant from the industrial point of view because the bacteria and mold tested represent types which have been a frequent cause of expensive trouble in many food industries.

It is realized that the results obtained do not imply that the tested microorganisms were destroyed instantly, but the results do imply that the paint containing 4 per cent of halogenated oil does possess the unusual property of inhibiting microorganism growth. The application of such a paint should minimize contamination and sources of contamination normally encountered on surfaces coated with ordinary general-use commercial paint which loses its germicidal property upon drying.

An important deduction to be drawn from the experimental work is that the bacterial and mold spores which failed to grow were not limited to those in actual contact with the paint but also included those which were located at a considerable distance from the surface of the dried paint film. At this point, it is felt that a quotation from Buchanan, R. E. & Fulmer, E.I. (Physiology of Bacteria, Vol. II p. 218)[1] defining an "antiseptic" would signify the value of the unusual property of the paint under discussion: *"It is customary to define an antiseptic as a substance which will inhibit the growth of bacteria, or of other organisms, as yeasts and molds. When microorganisms are not growing, they are dying, therefore, an antiseptic is any substance which kills organisms slowly. It is in essence synonymous with germicide, differing only as indicating a slower rate at which the organisms are destroyed."*


**Do you have trouble keeping mold from forming in food storage rooms? Would you like to know about a simple method that helps prevent it . . . that helps avoid losses due to its presence?**

**Then here is good news for you . . . a simple, inexpensive method has been developed that has proven highly successful in many plants. This brand new idea employs in a NEW way the powerful mold and bacteria killing properties of OAKITE BACTERICIDE. Let us tell you about this unique method . . . particularly effective during extremely hot weather.**

**Where Can This Method Be Applied?**

**In storage rooms for eggs, meats and perishable foods; in storage cellars such as those found in breweries, wineries, and distilleries; meat curing rooms; in storage rooms for fruits such as oranges, lemons, apples, grapes; cellars, caves and buildings growing mushrooms.**

**Don't delay . . . write today. No obligation.**

**Manufactured only by**
**OAKITE PRODUCTS, INC., 26G Thames St., New York, N. Y.**
*Branch Offices and Representatives in All Principal Cities of the U. S.*

**OAKITE**
TRADE MARK REG U.S PAT OFF.
SPECIALIZED INDUSTRIAL CLEANING MATERIALS & METHODS

## What is a Supermarket

(*Continued from page* 394)

This point is usually after the third or fourth row. When the space requirements for maximum sales of an item are better known most markets will stock many additional items.

### *Shopping Conveniences*

How often in the grocery store does a customer end her shopping with the last item on her list, especially when others are waiting for a clerk. What a large volume of sales are therefore lost—what additional sales might have been made! The super-market furnishes facts that prove the weaknesses of other systems. At the exit counters where customer's items are checked and the amount of the total purchase determined, boxes are kept in readiness to receive the groceries that are hourly returned. The urge to buy is so great that total purchases often amount to more than the cash in pocket. The convenience of the super-market's self service, the great variety of foods, and the buying urge created by the mass displays, combine to induce the maximum customer purchases. It is significant that when a part of a purchase must be returned, because of over-buying, it is the expensive luxury merchandise that comes back. The more expensive merchandise finds its way even into the baskets of those with limited pocket books and is only returned when the customer finds that he has overspent.

Shopping in a super-market is as free of obstacles, both mental and physical, as shopping has ever been made. The aisles are wide. They do not seem congested. One wanders about limited only by one's time. Ahead are always row on row of tempting foods still to be visited. No one urges—no one suggests. One does not wait one's turn—one is never hurried. Leisurely one inspects this can, then its neighbor, reads the labels, weighs one value against the other. Soon the market baskets on the perambulators are loaded. The book agent well knows that once the pen is in the prospect's hand, the signature on the contract is sure to follow. If the super-markets can get people inside the store—wandering about, inspecting, handling—sales are sure to follow. The average super-market sale per customer is approximately 3.6 times the average chain store sale per customer.

### *Prices and Advertising*

Though the prices of trade branded merchandise quoted in super-market advertising may be below the prices of the same trade branded items advertised by others, it does not follow that super-markets slash prices on all items offered for sale. It must be remembered that the modern super-market displays thousands of non-perishable grocery items. Few of these have a recognized price rating with the consumer. On many such items the super-market gets a very long profit.

One of the salient merchandising inducements of the super-market is variety. The chain store depends on a large turnover of a limited number of items. The super-market can operate profitably on a much smaller turnover and can afford to stock, therefore, many more items.

Generally, super-markets concentrate their advertising in local news-


PRODUCTION PROBLEMS SOLVED TO ORDER

ALMOST every modern plant in the food industries is already applying the Continuous Flow Principle in some degree. All bottle, can or carton filling machines and most labeling and wrapping machines are based upon this principle.

The next step is to unify the operation of the entire plant so that there is Continuous Flow at maximum speed from the receiving of raw materials to the shipping of finished product.

Mathews engineers are trained to see production as one total process based upon Continuous Flow. A Mathews survey is problem solving to order, revealing bottle-necks if they exist, placing every processing step in its logical sequence, eliminating lost motion and unnecessary handling.

Mathews systems, backed by over 32 years' engineering, make maximum logical use of gravity, and include Roller, Wheel, Belt, Live Roller, Drag Chain, Pallet, Continuous Apron, Trolley Conveyers, Vertical and Inclined Elevating Conveyers, Spiral Roller Conveyers and Spiral Chutes.

"Problems Solved with Mathews Conveyer Systems" is a book which illustrates many typical examples of the Continuous Flow Principle. Write for it today.

*The illustration at the left shows an efficient layout of conveyers in the bottling house of a Pennsylvania Distillery. An inclined, level, declined, and level belt conveyer with roller conveyer is used to convey empty cartons from warehouse to packers.*

●

*An outstanding application of the Continuous Flow Principle of Handling Materials. A four-tier bread cooler handling 35,000 loaves per day.*

MATHEWS CONVEYERS

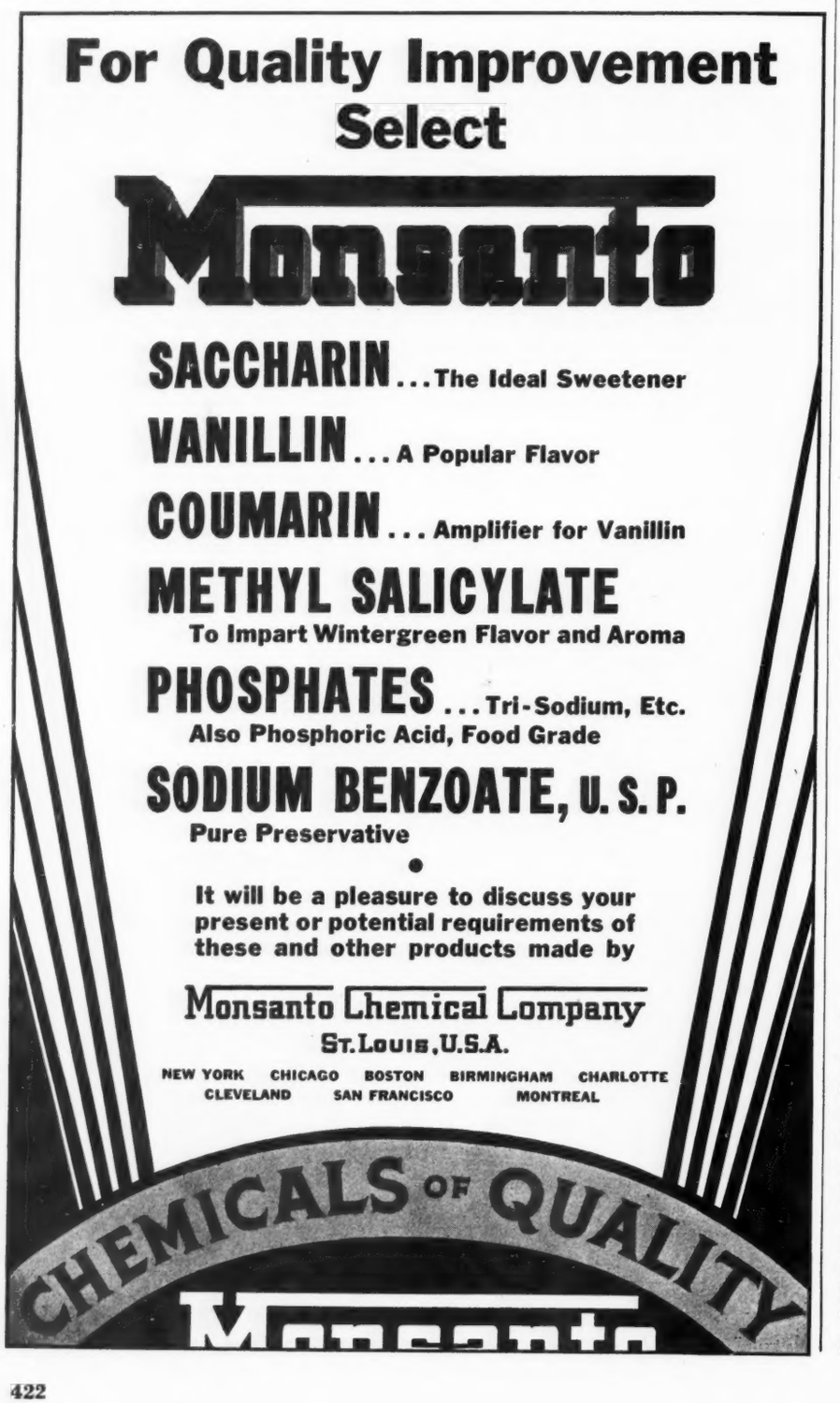
CONTINUOUS FLOW PRINCIPLE IN HANDLING MATERIALS

MATHEWS CONVEYER COMPANY
116 Tenth Street, Ellwood City, Penna.

papers. They use large space. Some few use local radio stations, mostly with spot announcements. Handbills have little favor.

Before the era of chain stores, few grocers advertised. Newspaper space was too expensive for the independent store. Local newspaper grocery advertising expanded with the expansion of the chain. More correctly stated, the chains expanded because they could afford to advertise. One of the chief inducements offered to encourage independents to join voluntary chains is the regular group advertising offered at a very small proportionate cost. With many independents the offer of regular advertising is a greater inducement than the membership discounts or the merchandising aid of the voluntary organization. Some voluntaries maintain an organization with no advantage to members other than regular group advertising.

Without advertising, the small independent is handicapped. Limited sales do not permit the independent to compete in advertising with chains and voluntaries. Annual sales of large super-markets are, however, equivalent to sales of from 10 to 50 chain store units, and the price spread permits them to allot a larger percentage of gross sales to the advertising budget. Many super-markets have raised the advertising ante on the chain as well as beating them at their own game of price-cutting.



For Quality Improvement
Select
Monsanto
SACCHARIN ... The Ideal Sweetener
VANILLIN ... A Popular Flavor
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### *Super-Markets Trading Up*

The super-markets are entering better residential districts. In these newer markets, more costly equipment is installed, and a greater variety of items are on display. The additional items are quality foods which the super-market must stock to attract and hold the trade of the higher income groups. During the study of super-markets, the one question that was most asked by owners and operators was: "How do other super-markets describe products on display so that discriminating customers can be warned against cheaper and less desirable quality merchandise, which the super-market must stock to accommodate those less able to make a choice?" Super-markets favor grade labeling.

### *Consumer Viewpoints*

Many customers in the hundred or more super-markets visited were questioned to obtain a cross-section of the customers' viewpoint. Their comments are significant. Comments of women: "I can change my mind if I want to. I can put back anything I don't want when I find something I like better." "How far do I drive? About 5 miles. Yes, I come regularly. Why? I guess it's just because I like to shop." Comment of a group of four women: "We always lunch together in town on Thursdays, go to a movie, and stop at the market on the way home. Saves many trips to the store during the week." Comment of member of family group: "What we save on groceries we lose on car expense. In the end we save nothing by coming to the super-market, but it's a lot of fun." Comment of youngsters, "Sure, we like to come to the Food Fair. We get to stay up late and always go to a movie afterward, every week." Comment of man who, with his wife, had just spent $14.95 for groceries, "We always plan to spend less than $10, but we never do."

(*Continued from page 405*)

mental concentrate, sterilized three hours at 105 deg. C. (221 deg. F.); two concentrates, one with 36 per cent and one with 28 per cent solids, and dilutions of these, each with 50 per cent water; a Hungarian tomato powder and a paste made from it; canned tomatoes with soluble matter extracted, and the same with 25 per cent powdered sugar added.

In canned tomatoes of good quality, dilution intensifies the red and yellow components of the color, making the orange component clearer and less red. In low-grade products, dilution tends to shift the color toward yellowish orange. In tomato juice for beverage use the red component greatly predominates over yellow and orange before concentration, but the effect of concentrating the juice is to destroy much of the red color. In tomato powder the red, yellow and blue components are all intensified when water is added to make a paste.

Digest from "Colorimetry of Canned Foods," by Oreste Carrasco, *l'Industria Italiana delle Conserve Alimentari 12*, 1. 1937 (Published in Italy)

## DAIRY PRODUCTS

### *Relation of Temperature To Homogenizing*

THE TEMPERATURE HISTORY prior to homogenization at temperatures between 50 and 100 deg. F. has an influence on the properties of milk and creams. To obtain all the properties of well homogenized milk and cream, it is necessary at the time of homogenization to have the fat in the liquid state by suitable temperature adjustment.

Homogenizing milk at 50, 60, 70 and 80 deg. F. failed to alter the curd tension or the size of the fat globules, while the cream line was reduced considerably. Homogenization at 100 deg. F. was necessary to effect a noticeable subdivision of fat globules. However, when the milk had been heated to 145 deg. F., and then cooled, noticeable subdivision occurred after homogenization at 80 deg. F., and the cream line was destroyed after homogenization at 70 deg. F. (No mention is made of the time of cooling.—Ed.) Curd tension was also reduced more effectively. Homogenization at 80, 90 and 100 deg. F. increased the surfaces of the fat globules sufficiently for lipolytic action to cause rancid flavor. This rancid flavor was eliminated when the milk was first preheated to 120 deg. F., or higher, and then cooled down to homogenizing temperature.

A minimum homogenizing temperature of 90 deg. F. for cream was required to produce an appreciable subdivision of the fat globules, when the cream had been warmed from 40 deg. F., whereas a minimum of 80 deg. F. was sufficient to produce equivalent results when the cream had been preheated to 145 deg. F. and then cooled. Viscosity decreased slightly when homogenization took place on cream warmed from 40 to 50 to 60 deg. At 80 deg. F. or above there was an increase in viscosity. Feathering in coffee was noted in all samples homogenized, except at 50 to 70 deg. F., when the cream had first been held overnight at 40 deg. F. No definite off flavor developed except a slightly cooked flavor in samples heated to 175 deg. F.

Digested from "The Effect of Homogenization at Different Temperatures on Some of the Physical Properties of Milk and Cream," by R. Whitaker and L. D. Hilker. *Journal of Dairy Science*, 20, 281, 1937.

### *Wrappers for Processed Cheese*

SEVEN SPECIFICATIONS for a satisfactory wrapper for processed cheese include: 1. Uniformly close seal or contact with the cheese mass to eliminate air pockets; 2. Retention of moisture; 3. Edges of the wrapper must cling together; 4. Wrapper must not impart any off flavor or color to the cheese; 5. Wrapper must not be affected by the cheese; 6. Wrapper should give a pleasing appearance; 7. Cost should be low.

Since too rapid cooling of the freshly wrapped molten cheese mass may result in syneresis (weeping), the cooling must be slow. And this aggravates any interaction between the cheese and its wrapper.

When cellulose and rubber composition films are used, they must be heat-sealed which results in peculiar and disagreeable surface taint.

Tin foil is most commonly used as a cheese wrapper but it sometimes darkens. Of the various explanations possible, it appears that blackening results from a galvanic action between the tin and antimony in the foil resulting in salts which blacken in contact with oxygen. England requires coating the foil with an enamel comparable to the enamels for interiors of tin cans.

Blackening of tin foil on cheese is most marked where phosphate emulsifiers are used in the cheese, also when the cheese is more alkaline than pH 5.8.

Aluminum foil wrappers for cheese are rather easily corroded by the cheese salts, but protective coatings of "shellacs" and "resins" have proved satisfactory. Bare aluminum foil is difficult to handle in automatic packaging machines, but German aluminum foil manufacturers claim that their coatings not only prevent corrosion but facilitate automatic packaging.

Lead foil, though not suitable anyway, discolors badly in a few days.

Digested from "Wrappers for Processed Cheese," by H. L. Templeton and H. H. Somers. *Journal of Dairy Science*, 20, 231, 1937.

## FATS & OILS

### *Hazelnut Oil*

A CAREFUL CHEMICAL STUDY of hazelnut oil, made to confirm a previous analysis indicating that the oil contains a solid unsaturated fatty acid, led to an unexpected result. The previous analysis had been made by the Twitchell method, in which the reagent is lead acetate in alcohol. In the new study an oxidation method was used, with pure (extracted) oil from French hazelnuts. The result was a complete surprise because the unsaturated fatty acids, when isolated and identified, were found to be chiefly oleic acid (about 81 per cent of the total fatty acids) and linoleic acid (about 10 per cent of the total fatty acids). Saturated acids account for nearly all of the remainder and no solid unsaturated acid was found at all.

This shows that great caution must be exercised in interpreting results obtained by the Twitchell method as applied to estimation of the proportion of solid unsaturated acids in an oil. But for practical purposes the really important result of the investigation is the discovery that hazelnut oil has such a high oleic acid content. Tsubaki and coula oils surpass it in this respect, but among the relatively abundant, commercially available oils, hazelnut oil now takes a very high rank as a potential source of pure oleic acid. It contains a much higher proportion than do olive, almond and peanut oils, in which from 55 to 64 per cent of the total fatty acids is oleic acid.

Digest from "Hazelnut Oil," by S. H. Bertram, *Oele, Fette, Wachse, Seife, Kosmetik*, p. 2, November, 1936.

### *To Test Artificially Colored Fats and Oils*

A NEW INSTRUMENT AND METHOD for detecting artificial coloring of fats and oils, and gaining an idea of the nature of the coloring matter, utilizes a principle called "chromatographic analysis." The sample of fat or oil is passed downward through a vertical column of a solid absorbent such as alumina or a decolorizing clay. The natural coloring matter in fats (usually carotin or xanthophyll) does not impart any very pronounced color to the absorbent, but artificial coloring is different. Natural and synthetic dyes, added to butter, cocoa butter, sesame oil or the like, give "chromatographs" which are quite characteristic for different dyes. They also differ according to the adsorbent, so that alumina gives excellent chromatographs with acid dyes (whether synthetic, like Martius Yellow, or natural, like bixin) while a more acidic decolorizing clay gives the best results with basic dyes such as Dimethyl Yellow or p-aminoazobenzene.

The test is very sensitive even for natural dyes like annatto, and extremely sensitive for some of the synthetic dyes, of which as little as 1 part in about 2,500,000 can be detected. To make a test the sample is dissolved in about twice its weight of benzene and filtered slowly through a column of the adsorbent in a narrow vertical tube. If a dye is present a ring of color appears near the top of the column of adsorbent. The color and the appearance of the ring (sharpness, depth and other characteristics) indicate the kind and to some extent the amount of artificial coloring.

Digest from "Application of Chromatographic Analysis to Detection of Artificial Coloring in Fats and Oils," by H. Thaler, *Fette und Seifen*, 44, 38, 1937. (Published in Germany)

## RAW PRODUCE

### *Ripening Fruits Artificially*

ACCELERATED RIPENING EXPERIMENTS were made with bananas, tomatoes and other fruits in atmospheres containing ethylene (0.2 to 2 per cent), acetylene (0.2 to 2 per cent) or excess oxygen (50 per cent). The effect is not merely superficial, nor is it limited to the appearance of ripening. The chemical changes which characterize the transition from green to ripe fruit are accelerated, so that the treated fruit is actually ripe. Thus, bananas exposed to ethylene contained 13.82 per cent total sugars on the eleventh day, as compared with 4.52 per cent in untreated bananas. Formation of the fruit acids follows a similar course. Oxygen-enriched air does not differ greatly from ethylene and acetylene as a ripening agent.

A peculiar circumstance, not yet fully understood, is that commercial ethylene is much more potent than the purified gas. Evidently a gaseous impurity in commercial ethylene is an exceptionally active accelerator. A search will be made to ascertain the identity of this gas. Pure acetylene is comparable with pure ethylene. No experiments with commercial acetylene are reported. In tomatoes, in which the color change of ripening is especially conspicuous, parallel changes were observed in sugar content and acidity as accelerated ripening progressed.

Digest from "Artificial Ripening of Fruits and Vegetables," by A. Zavanaju, *Rivista del Freddo* 23, 83, 1937. (Published in Italy.)

### *Six Methods of Cold Storage for Grapes*

COLD STORAGE EXPERIMENTS with six varieties of table grapes (four white, one red, one purple) showed that two of the white varieties did not keep well under any of the experimental conditions. The red grapes kept best, the purple grapes and the other two white varieties being intermediate in behavior. The grapes were considered to be fresh until total loss (spoilage and weight loss) reached 20 per cent. The time at which this limit was passed was considered to be the longest permissible storage time.

Six methods of packing in the storage space were tried, namely: in sawdust, in peat, in cork, wrapped in moistureproof "Cellophane," wrapped in iodized paper, and suspended over water in hermetically sealed vessels. Wrapping in iodized paper gave the best results. The difficulty with the moistureproof wrapping is believed to be interference with transpiration. Storage over water causes objectionable moisture condensation on the fruit.

Sawdust packing gives acceptable keeping during cold storage, but spoilage is too rapid after removal from the cold room. The longest storage time was three months, attained with the red grapes.

Digest from "Cold Storage of Table Grapes," by G. Kaess, *Zeitschrift für die gestame Kälteindustrie*, 44, 10, 1937.

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## SUGAR

### *Where Contamination of Sugar Occurs*

SUGARS of high chemical purity, averaging well above 99 per cent sucrose, possess a typical and inherent flora of microorganisms consisting of bacteria, yeast, and mold fungi. Unless provision is made for the protection of sugar from this contamination, it may reach high proportions and introduce unsuspected hazards in the food industry where the sugars are used in products that are not subject to sterilization.

Of these microorganisms, only the spore-forming bacteria are able to survive the temperatures attained in processing the raw material, and of this group only the thermophilic, or heat-loving, forms have proved troublesome in the industrial usages of sugars.

Some years ago it was found that the thermophilic bacteria in sugars are the cause of the spoilage of canned corn, and since that time definite standards have been adopted by the National Canners Association which limit the number of spores of these thermophiles to a maximum of 50 per 10 grams.

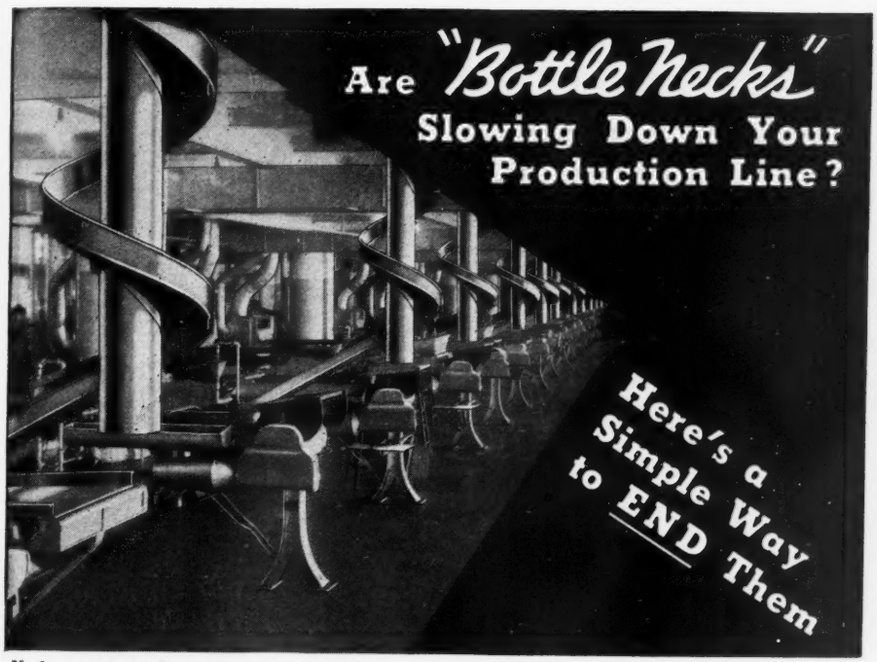
The authors over a period of years have studied the thermophilic contaminants in sugars from a number of refineries, and have also observed the variation in the numbers of these microorganisms in samples collected at various times during the day and at various seasons of the year.

As a result of these studies it has been shown that the period of highest infection of sugars in the refinery under observation occurs in the late afternoon, and the seasonal variation indicates that the greatest infection of the year is in the late fall months.

The daily variation is thought to be due to the coincidence of cycles of operations, and the seasonal fluctuations, to the quality of sugars being refined at that time of the year.

These studies have also shown that the two groups of thermophilic organisms occurring in sugars, the "flat sours" and the "non-flat sours," seem competitive in their association. Where one occurs in large numbers the other is correspondingly low.

Digest from a paper presented by Wm. L. Owen, at Chapel Hill, N. C., meeting of American Chemical Society, 1937.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## MISCELLANEOUS

### *Industrial Uses for Pectin*

A NUMBER OF PECTIN PREPARATIONS from apples and from citrus fruits were tested for comparison of their behavior as protective colloids in dispersions of insoluble substances in water. Commercial pectins have an acid reaction and a negative charge. Their solutions show only a slight loss in viscosity on long standing, provided they have been protected from bacterial action by addition of an antiseptic. Prolonged exposure to moderate heat has little effect, but heating about 60 deg. C. (140 deg. F.) causes a rapid drop in viscosity due to chemical degradation of the pectin. Acids cause only a mild viscosity decrease, but alkalis cause chemical changes in pectin solutions accompanied by a sharp drop in viscosity.

The dispersion tests showed that pectin is a very useful protective colloid for maintaining difficulty dispersible metals in the sol state in water. Thus copper can be dispersed in water, with the aid of pectin, to give clear, bright red, stable sols. Silver can be dispersed in a similar way. The stability of the pectin solutions to heat is surprising because a heat treatment sufficiently severe to cause noticeable degradation of the pectin actually increases its efficacy as a protective colloid.

Digest from "Pectin as a Protective Colloid," by E. Sauer and K. Sanzenbacher, *Kolloid-Zeitschrift* 79, 55. 1937. (Published in Germany.)

# BOOKS RECEIVED

FOOD TECHNOLOGY. By Samuel C. Prescott and Bernard E. Proctor, Massachusetts Institute of Technology. Published by McGraw-Hill Book Co., Inc., 330 West 42d St., New York, N. Y. 1937. 639 pp.; 6½x9¼ in.; cloth; illustrated. Price, $5

Giving as it does information on the sources of the most important foods and methods of preparing them for market, this book is the first of its kind. No other book has treated of food technology in the broad sense, covering the major food-processing operations. The book provides in concise form for executives and technical men information useful not only because it covers particular branches of the food industry but because it gives a composite picture of the industrial technic of preparing food for human consumption.

With the introduction, there are 22 chapters. Two are devoted to the unit operations of refrigeration and dehydration, and the others to particular classes of products. These latter chapters include: "Wheat and Milling;" "Corn and Corn Products;" "Minor Cereals;" "Vegetables;" "Fruits;" "Sugars and Sirups;" "Meat and Meat Products;" "Fish and Fish Products;" "Poultry and Eggs;" "Milk;" "Dairy Products;" "Baking;" "Canning;" "Salt, Vinegar and Pickled Products;" "Vegetable Oils, Mayonnaise;" "Fruit Juices;" "Jellies and Jams;" "Confectionery," and "Coffee, Tea and Spices."

THE NUTRITIVE VALUE OF FRUITS, VEGETABLES, AND NUTS. By R. A. McCance, E. M. Widdowson, and L. R. B. Shackleton. Medical Research Council. Published by His Majesty's Stationery Office, London England 1936. 107 pp. 6x9⅝ in.; paper; illustrated. Price 65 cents. Obtainable through British Library of Information, 270 Madison Ave., New York, N. Y.

Published as Special Report Series No. 213 of the Privy Council, this study deals with the chemical composition of fruits, vegetables, and nuts and changes produced in their composition by cooking and processing.

Methods of cooking or processing studied are: Steaming at 100 deg. C., retorting or pressure cooking at temperatures above 100 deg. C., boiling, baking, and deep and shallow fat frying.

While these studies were made from a nutritional point of view they will serve as a guide to food manufacturers who are desirous of knowing what takes place in their products during processing.

STATISTICAL YEAR BOOK OF THE LEAGUE OF NATIONS. Published by League of Nations, Geneva 1936. 340 pp.; 7½x9¾ in.; cloth. Price, $3.50. Obtainable from World Peace Foundation, 8 West 40th St., New York, N. Y.

Printed in French and English text, this compilation contains available statistics of every kind pertaining to the nations of the world.

Of particular interest to food manufacturers are the statistics on the production and consumption of live-stock, fisheries, and agricultural products. Data on exports are also included.

Tables on population movements, exchange rates, employment, and finance are among those which have been put into more usable form. Those on fisheries have not been given in former editions.

PROCESSES FOR NON-ACID CANNED FOODS IN METAL CONTAINERS. Published by National Canners' Association Research Laboratory, Washington, D. C. May, 1937. 45 pp.; 5x7¾ in.; paper.

Industrial canning procedures, equipment, processing tables, and sources and control of spoilage contamination are covered in this bulletin, which is in its third edition. The processing tables list retort times and temperatures for different can sizes.

# PATENTS

**Beers and Ales Aged Quickly by the Addition of Papain-Type Enzyme and Bacterial Metabolic Substances**—Leo Wallerstein, New York, N. Y. No. 2,077,446. April 20, 1937.

**Beers and Ales Stabilized and Chill-Proofed by the Addition of Pepsin-Type Enzymes Mixed With Bacterial Metabolic Substances**—Leo Wallerstein, New York, N. Y. No. 2,077,447. April 20, 1937.

**Beers and Ales Stabilized and Chill-Proofed by the Addition of Pepsin-Type Enzymes, Mixed With Metabolic Products Obtained Through Growth of Molds**—Leo Wallerstein, New York, N. Y. No. 2,077,448. April 20, 1937.

**Malt Beverages Stabilized and Chill-Proofed by the Addition of Papain-Type Enzymes Mixed with Metabolic Products Obtained From Growth of Molds**—Leo Wallerstein, New York, N. Y. No. 2,077,449. April 20, 1937.

**Fresh Fruit, Meat and Vegetables Frozen With or Without Formation of a Glaze During Passage Through Jacketed Circular Tunnel Which is Cooled by a Counter-Flowing Refrigerating Fluid to Give Temperatures not Higher Than 0. Deg. F.**—Henry James Wood, Randwick, Sidney, N.S.W., Australia, one-third to Eric Gordon-Hume, Sidney, N.S.W., Australia. No. 2,077,608. April 20, 1937.

**Bread Loaves Wrapped With Printed Sulphite Waxed Paper and With Transparent Cellulose to Give Window View of Loaf on Bottom**—Philippe J. Couture, Lewiston, Me. No. 2,077,743. April 20, 1937.

**Pretzels Twisted by Mechanical Means**—Harry A. Elliott, Jefferson, Iowa. No. 2,077,993. April 20, 1937.

**Maple-Flavored Sugar Crystals Made Non-Staining and Non-Sticky by Use of Glycerine**—Hugh E. Allen, one-half to Albert G. McCaleb, Evanston, Ill. No. 2,078,215. April 27, 1937.

**Ascorbic Acid Made From Fresh Gladiola Leaves**—Otto Dalmer and Hermann Wieters, Darmstadt, Germany, to Merck & Co., Inc., Rahway, N. J. No. 2,078,237. April 27, 1937.

**Furfural Fractionally Distilled From Solution Immiscible With Water**—Ellis I. Fulmer, Leo M. Christensen and Ralph M. Hixon, Ames, Iowa, to the Chemical Foundation, Inc. No. 2,078,241. April 27, 1937.

**Oil Separated From Fish Livers by Steaming at Temperatures not Greater Than 100 Deg. C., Cooling to Below Freezing Temperatures, Extracting With Organic Solvents, and Steam Distilling in the Absence of Air**—Carl Nielsen, Lake Bluff, Ill., to Abbott Laboratories, North Chicago, Ill. No. 2,078,404. April 27, 1937.

**Vegetable Oils Saponified to Form Soap by Cold Process**—Carl H. Haurand, North Plainfield, N. J., to Best Foods, Inc., New York, N. Y. No. 2,078,726. April 27, 1937.

**Chewing Gum Base Prepared From Alpha and Beta Amyrins Extracted From Gum Elemi**—Dean M. Jackman, Bayside, N. Y., to American Chicle Co., Long Island City, N. Y. No. 2,078,878. April 27, 1937.

**Liquid Vegetable Milk Made From Soybeans**—Harry Willis Miller, Shanghai, China. No. 2,078,962. May 4, 1937.

**Rancidity-Resistant Powdered Coconut Made From Whole Coconut Meats**—Robert T. Northcutt, Cranford, N. J. No. 2,079,030. May 4, 1937.

**Fruits With a Natural Waxy Surface Given a Heat and Scrubbing Treatment to Remove Surface Dirt**—James J. R. Bristow, Safety Harbor, Fla. No. 2,079,278. May 4, 1937.

**Peanut Butter Emulsified With an Edible Oil and Strained Bee Honey to Prevent Separation of an Oil Layer**—Frederick H. Hoffman, Columbus, Ohio. No. 2,079,288. May 4, 1937.

**Lemons Cured in Atmosphere Having a Temperature Range Between 52 and 60 Deg. F. and a Relative Humidity Range Between 88 and 93 Per Cent With a Controlled Carbon Dioxide Content**—Lambert H. Polderman, Los Angeles, Calif., to Carrier Corp., Newark, N. J. No. 2,079,304. May 4, 1937.

**Chewing Gum Packaged in a Cellulose Acetate Outer Wrapper From Which One End May Be Removed Without Destroying Remainder of Wrapper Container**—Douglas M. McBean to Beech-Nut Packing Company, Canajoharie, N. Y. No. 2,079,328. May 4, 1937.

**Shortening Compound With Very Low Moisture Content Prevented From Graining by Addition of Small Amount of an Ammonium Salt**—Anderson W. Ralston and Victor Conquest to Armour & Co., Chicago, Ill. No. 2,079,336. May 4, 1937.

**Decolorized Liquid Flavoring Concentrate Made From Black Pepper**—Arthur A. Levinson to William J. Strange Co., Chicago, Ill. No. 2,079,415. May 4, 1937.

**Fruit Juices Extracted Under Aseptic Conditions and Kept in a Sterile State**—Louis E. Bauer, and Harold F. Peavey, Springfield, Mass., to Citrus Products Equipment Co. No. 2,079,542. May 4, 1937.

**Ground Coffee Moistened to a Standardized Content Preliminary to Flaking**—Ronald B. McKinnis, Pittsburgh, Pa. to Continental Can Co., Inc., New York, N. Y. No. 2,080,327. May 11, 1937.

**Chocolate Refined in a Five-roll Refiner Having Four Rolls Horizontally Parallel to Each Other in a Vertical Plane**—Allan Ashmead Tunley and John Currie Paterson, Peterborough, England to Baker-Perkins, Inc., Saginaw, Mich. No. 2,080,364. May 11, 1937.